Colour Television

Chassis

TPN1.1HA

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Service Manual

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PHILIPS

1. Revision List

Manual xxxx xxx xxxx.0
- First release.

2. Technical Specifications and Connections

Index of this chapter:
2.1 Technical Specifications
2.2 Directions for Use
2.3 Connections
2.4 Chassis Overview

Notes:
- Figures can deviate due to the different set executions.
- Specifications are indicative (subject to change).

2.1 Technical Specifications

For on-line product support please use the links in. Here is product information available, as well as getting started, user manuals, frequently asked questions and software & drivers.

Table 2-1 Described Model Numbers

Model Number	Styling	Published in
32HFL5332/93	Pro Plus	3122 785 19020
32HFL5332/97	Pro Plus	3122 785 19020
37HFL5382/93	Pro Plus	3122 785 19020
42HFL5382/93	Pro Plus	3122 785 19020

Note: The given Model Numbers are subject to change.

2.2 Directions for Use

Directions for use can be downloaded from the following websites:
http://www.philips.com/support
http://www.p4c.philips.com

2.3 Connections

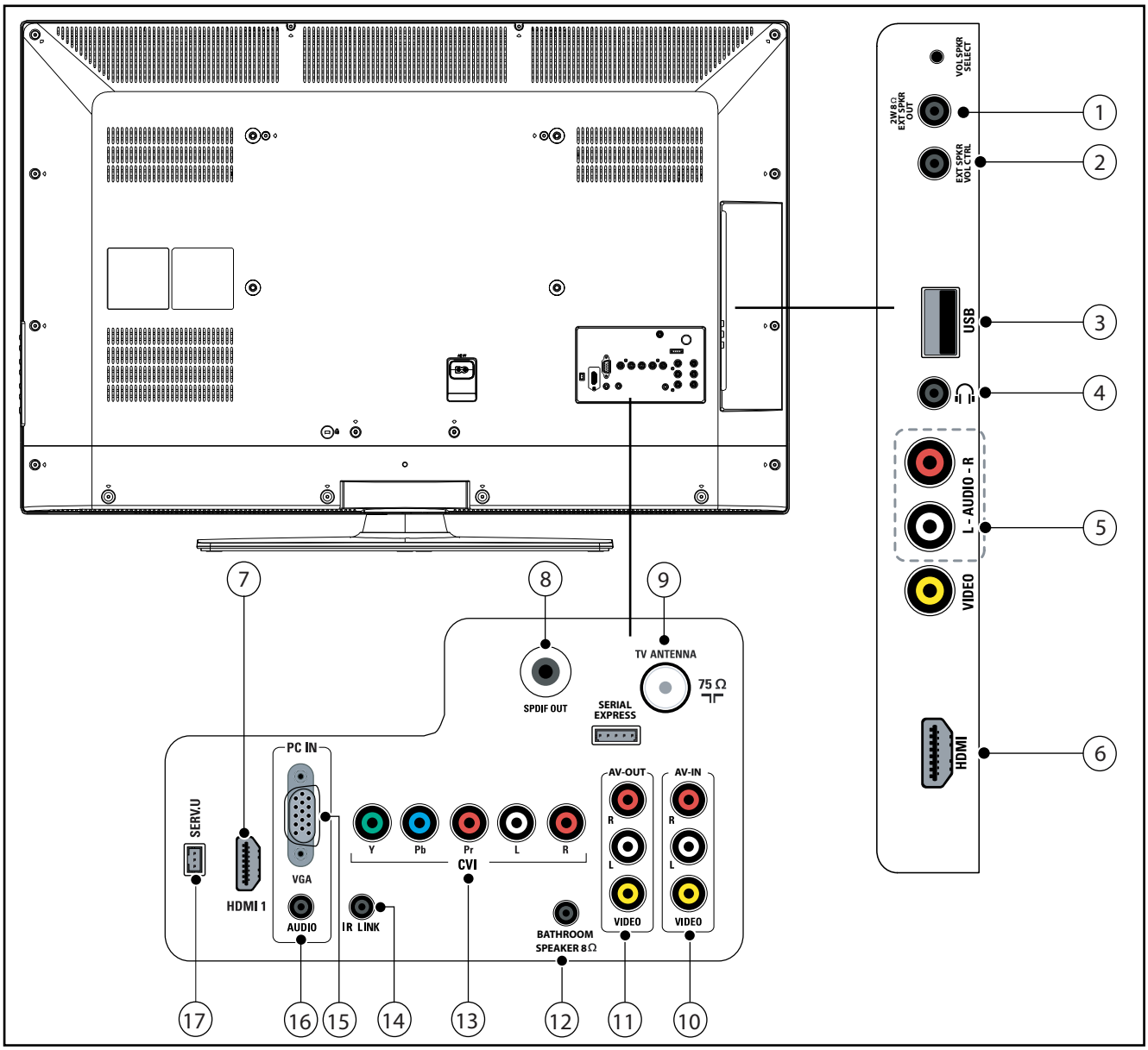

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Figure 2-1 Connection overview

Note: The following connector colour abbreviations are used (acc. to DIN/IEC 757): Bk= Black, Bu= Blue, Gn= Green, Gy= Grey, Rd= Red, Wh= White, Ye= Yellow.

2.3.1 Side Connections

1 - Mini Jack: EXT speaker (8 Ω / 2 W - Output)

1	- Control Signal	OUT-
2	- Control Signal	OUT+
3	- Control Signal	OUT+

2 - Mini Jack: EXT speaker volume contro (Input)

1	- Control Signal	IN-
2	- Control Signal	IN+

3 - USB2.0

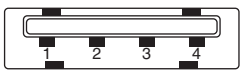

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Figure 2-2 USB (type A)

1	- +5V	
2	- Data (-)	
3	- Data (+)	
4	- Ground	Gnd

4 - Head phone (Output)

Bk	- Head phone	80 - 600 Ω / 10 mW

5 - Cinch: Audio - In

Ye	- Video CVBS	1 V_{PP} / 75 Ω
Rd	- Audio R	0.5 V_{RMS} / 10 kΩ
Wh	- Audio L	0.5 V_{RMS} / 10 kΩ

6 - HDMI: Digital Video, Digital Audio - In

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Figure 2-3 HDMI (type A) connector

1	- D2+	Data channel	⊕
2	- Shield	Gnd	⏚
3	- D2-	Data channel	⊕
4	- D1+	Data channel	⊕
5	- Shield	Gnd	⏚
6	- D1-	Data channel	⊕
7	- D0+	Data channel	⊕
8	- Shield	Gnd	⏚
9	- D0-	Data channel	⊕
10	- CLK+	Data channel	⊕
11	- Shield	Gnd	⏚
12	- CLK-	Data channel	⊕
13	- n.c.		
14	- n.c.		
15	- DDC_SCL	DDC clock	⊕
16	- DDC_SDA	DDC data	⊕⊖
17	- Ground	Gnd	⏚
18	- +5V		⊕
19	- HPD	Hot Plug Detect	⊕
20	- Ground	Gnd	⏚

2.3.2 Rear Connections

7 - HDMI1: Digital Video, Digital Audio - In

See 6 - HDMI: Digital Video, Digital Audio - In

8 - Cinch: S/PDIF - Out

Bk	- Coaxial	0.4 - 0.6V_{PP} / 75 ohm	⊖◎

9 - TV ANTENNA - In

Signal input from an antenna, cable or satellite.

10 - Cinch: Audio - In

See 5 - Cinch: Audio - In

11 - Cinch: Audio - Out

Ye	- Video CVBS	1 V_{PP} / 75 Ω	⊖◎
Rd	- Audio R	0.5 V_{RMS} / 10 kΩ	⊖◎
Wh	- Audio L	0.5 V_{RMS} / 10 kΩ	⊖◎

12 - Mini Jack: Bathroom speaker (8 Ω / 1 W - Output)

1	- Control Signal	OUT-	⊖◎
2	- Control Signal	OUT+	⊖◎
3	- Control Signal	OUT+	⊖◎

13 - EXT2: Video YPbPr - In, Audio - In

Gn	- Video - Y	1 V_{PP} / 75 W	⊕◎
Bu	- Video - Pb	0.7 V_{PP} / 75 W	⊕◎
Rd	- Video - Pr	0.7 V_{PP} / 75 W	⊕◎
Wh	- Audio - L	0.5 V_{RMS} / 10 kW	⊕◎
Rd	- Audio - R	0.5 V_{RMS} / 10 kW	⊕◎

14 - Mini Jack: IR link (Input / Output)

1	- Control Signal	IN	⊕◎
2	- Control Signal	OUT	⊖◎
3	- Ground	Gnd	⏚

15 - PC IN:VGA

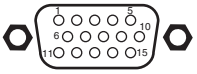

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Figure 2-4 VGA connector

1	- Video Red	0.7 V_{PP} / 75 Ω	⊕
2	- Video Green	0.7 V_{PP} / 75 Ω	⊕
3	- Video Blue	0.7 V_{PP} / 75 Ω	⊕
4	- n.c.		
5	- Ground	Gnd	⏚
6	- Ground Red	Gnd	⏚
7	- Ground Green	Gnd	⏚
8	- Ground Blue	Gnd	⏚
9	- +5V_{DC}	+5 V	⊕
10	- Ground Sync	Gnd	⏚
11	- Ground Red	Gnd	⏚
12	- DDC_SDA	DDC data	⊕
13	- H-sync	0 - 5 V	⊕
14	- V-sync	0 - 5 V	⊕
15	- DDC_SCL	DDC clock	⊕

16 - Audio - In: Left / Right, VGA

Gn	- Audio L/R in	0.5 V_{RMS} / 10 kW	⊕◎

17 - Service / UART

1	- Ground	Gnd	⏚
2	- UART_TX	Transmit	⊖
3	- UART_RX	Receive	⊕

2.4 Chassis Overview

Refer to 9. Block Diagrams for PWB/CBA locations.

3. Precautions, Notes, and Abbreviation List

Index of this chapter:

3.1 Safety Instructions
3.2 Warnings
3.3 Notes
3.4 Abbreviation List

3.1 Safety Instructions

Safety regulations require the following **during** a repair:

- Connect the set to the Mains/AC Power via an isolation transformer (> 800 VA).
- Replace safety components, indicated by the symbol ⚠, only by components identical to the original ones. Any other component substitution (other than original type) may increase risk of fire or electrical shock hazard.

Safety regulations require that **after** a repair, the set must be returned in its original condition. Pay in particular attention to the following points:

- Route the wire trees correctly and fix them with the mounted cable clamps.
- Check the insulation of the Mains/AC Power lead for external damage.
- Check the strain relief of the Mains/AC Power cord for proper function.
- Check the electrical DC resistance between the Mains/AC Power plug and the secondary side (only for sets that have a Mains/AC Power isolated power supply):
  1. Unplug the Mains/AC Power cord and connect a wire between the two pins of the Mains/AC Power plug.
  2. Set the Mains/AC Power switch to the “on” position (keep the Mains/AC Power cord unplugged!).
  3. Measure the resistance value between the pins of the Mains/AC Power plug and the metal shielding of the tuner or the aerial connection on the set. The reading should be between 4.5 MΩ and 12 MΩ.
  4. Switch “off” the set, and remove the wire between the two pins of the Mains/AC Power plug.
- Check the cabinet for defects, to prevent touching of any inner parts by the customer.

3.2 Warnings

- All ICs and many other semiconductors are susceptible to electrostatic discharges (ESD). Careless handling during repair can reduce life drastically. Make sure that, during repair, you are connected with the same potential as the mass of the set by a wristband with resistance. Keep components and tools also at this same potential.
- Be careful during measurements in the high voltage section.
- Never replace modules or other components while the unit is switched “on”.
- When you align the set, use plastic rather than metal tools. This will prevent any short circuits and the danger of a circuit becoming unstable.

3.3 Notes

3.3.1 General

- Measure the voltages and waveforms with regard to the chassis (= tuner) ground (⏚), or hot ground (⏚), depending on the tested area of circuitry. The voltages and waveforms shown in the diagrams are indicative. Measure them in the Service Default Mode with a colour bar signal and stereo sound (L: 3 kHz, R: 1 kHz unless stated otherwise) and picture carrier at 475.25 MHz for PAL, or 61.25 MHz for NTSC (channel 3).
- Where necessary, measure the waveforms and voltages with (⊓) and without (⊼) aerial signal. Measure the voltages in the power supply section both in normal operation (⏻) and in stand-by (⏻). These values are indicated by means of the appropriate symbols.

3.3.2 Schematic Notes

- All resistor values are in ohms, and the value multiplier is often used to indicate the decimal point location (e.g. 2K2 indicates 2.2 kΩ).
- Resistor values with no multiplier may be indicated with either an “E” or an “R” (e.g. 220E or 220R indicates 220 Ω).
- All capacitor values are given in micro-farads ($\mu = \times 10^{-6}$), nano-farads ($n = \times 10^{-9}$), or pico-farads ($p = \times 10^{-12}$).
- Capacitor values may also use the value multiplier as the decimal point indication (e.g. 2p2 indicates 2.2 pF).
- An “asterisk” (*) indicates component usage varies. Refer to the diversity tables for the correct values.
- The correct component values are listed on the Philips Spare Parts Web Portal.

3.3.3 Spare Parts

For the latest spare part overview, consult your Philips Spare Part web portal.

3.3.4 BGA (Ball Grid Array) ICs

Introduction

For more information on how to handle BGA devices, visit this URL: http://www.atyourservice-magazine.com. Select “Magazine”, then go to “Repair downloads”. Here you will find Information on how to deal with BGA-ICs.

BGA Temperature Profiles

For BGA-ICs, you **must** use the correct temperature-profile. Where applicable and available, this profile is added to the IC Data Sheet information section in this manual.

3.3.5 Lead-free Soldering

Due to lead-free technology some rules have to be respected by the workshop during a repair:

- Use only lead-free soldering tin. If lead-free solder paste is required, please contact the manufacturer of your soldering equipment. In general, use of solder paste within workshops should be avoided because paste is not easy to store and to handle.
- Use only adequate solder tools applicable for lead-free soldering tin. The solder tool must be able:
  - To reach a solder-tip temperature of at least 400°C.
  - To stabilize the adjusted temperature at the solder-tip.
  - To exchange solder-tips for different applications.
- Adjust your solder tool so that a temperature of around 360°C - 380°C is reached and stabilized at the solder joint. Heating time of the solder-joint should not exceed ~ 4 sec. Avoid temperatures above 400°C, otherwise wear-out of tips will increase drastically and flux-fluid will be destroyed. To avoid wear-out of tips, switch “off” unused equipment or reduce heat.
- Mix of lead-free soldering tin/parts with leaded soldering tin/parts is possible but PHILIPS recommends strongly **to avoid** mixed regimes. If this cannot be avoided, carefully clear the solder-joint from old tin and re-solder with new tin.

3.3.6 Alternative BOM identification

It should be noted that on the European Service website, “Alternative BOM” is referred to as “Design variant”.

The **third digit** in the serial number (example: AG**2**B0335000001) indicates the number of the alternative B.O.M. (Bill Of Materials) that has been used for producing the specific TV set. In general, it is possible that the same TV model on the market is produced with e.g. two different types of displays, coming from two different suppliers. This will then result in sets which have the same CTN (Commercial Type Number; e.g. 28PW9515/12) but which have a different B.O.M. number.
By looking at the third digit of the serial number, one can identify which B.O.M. is used for the TV set he is working with. If the third digit of the serial number contains the number "1" (example: AG**1**B033500001), then the TV set has been manufactured according to B.O.M. number 1. If the third digit is a "2" (example: AG**2**B0335000001), then the set has been produced according to B.O.M. no. 2. This is important for ordering the correct spare parts!
For the third digit, the numbers 1...9 and the characters A...Z can be used, so in total: 9 plus 26= 35 different B.O.M.s can be indicated by the third digit of the serial number.

Identification: The bottom line of a type plate gives a 14-digit serial number. Digits 1 and 2 refer to the production centre (e.g. AG is Bruges), digit 3 refers to the B.O.M. code, digit 4 refers to the Service version change code, digits 5 and 6 refer to the production year, and digits 7 and 8 refer to production week (in example below it is 2006 week 17). The 6 last digits contain the serial number.

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Figure 3-1 Serial number (example)

3.3.7 Board Level Repair (BLR) or Component Level Repair (CLR)

If a board is defective, consult your repair procedure to decide if the board has to be exchanged or if it should be repaired on component level.
If your repair procedure says the board should be exchanged completely, do not solder on the defective board. Otherwise, it cannot be returned to the O.E.M. supplier for back charging!

3.3.8 Practical Service Precautions

- **It makes sense to avoid exposure to electrical shock.** While some sources are expected to have a possible dangerous impact, others of quite high potential are of limited current and are sometimes held in less regard.
- **Always respect voltages**. While some may not be dangerous in themselves, they can cause unexpected reactions that are best avoided. Before reaching into a powered TV set, it is best to test the high voltage insulation. It is easy to do, and is a good service precaution.

3.4 Abbreviation List

0/6/12	SCART switch control signal on A/V board. 0 = loop through (AUX to TV), 6 = play 16 : 9 format, 12 = play 4 : 3 format
AARA	Automatic Aspect Ratio Adaptation: algorithm that adapts aspect ratio to remove horizontal black bars; keeps the original aspect ratio
ACI	Automatic Channel Installation: algorithm that installs TV channels directly from a cable network by means of a predefined TXT page
ADC	Analogue to Digital Converter
AFC	Automatic Frequency Control: control signal used to tune to the correct frequency
AGC	Automatic Gain Control: algorithm that controls the video input of the feature box
AM	Amplitude Modulation
AP	Asia Pacific
AR	Aspect Ratio: 4 by 3 or 16 by 9
ASF	Auto Screen Fit: algorithm that adapts aspect ratio to remove horizontal black bars without discarding video information
ATSC	Advanced Television Systems Committee, the digital TV standard in the USA
ATV	See Auto TV
Auto TV	A hardware and software control system that measures picture content, and adapts image parameters in a dynamic way
AV	External Audio Video
AVC	Audio Video Controller
AVIP	Audio Video Input Processor
B/G	Monochrome TV system. Sound carrier distance is 5.5 MHz
BDS	Business Display Solutions (iTV)
BLR	Board-Level Repair
BTSC	Broadcast Television Standard Committee. Multiplex FM stereo sound system, originating from the USA and used e.g. in LATAM and AP-NTSC countries
B-TXT	Blue TeleteXT
C	Centre channel (audio)
CEC	Consumer Electronics Control bus: remote control bus on HDMI connections
CL	Constant Level: audio output to connect with an external amplifier
CLR	Component Level Repair
ComPair	Computer aided rePair
CP	Connected Planet / Copy Protection
CSM	Customer Service Mode
CTI	Color Transient Improvement: manipulates steepness of chroma transients
CVBS	Composite Video Blanking and Synchronization
DAC	Digital to Analogue Converter
DBE	Dynamic Bass Enhancement: extra low frequency amplification
DCM	Data Communication Module. Also referred to as System Card or Smartcard (for iTV).
DDC	See "E-DDC"
D/K	Monochrome TV system. Sound carrier distance is 6.5 MHz
DFI	Dynamic Frame Insertion

DFU	Directions For Use: owner's manual
DMR	Digital Media Reader: card reader
DMSD	Digital Multi Standard Decoding
DNM	Digital Natural Motion
DNR	Digital Noise Reduction: noise reduction feature of the set
DRAM	Dynamic RAM
DRM	Digital Rights Management
DSP	Digital Signal Processing
DST	Dealer Service Tool: special remote control designed for service technicians
DTCP	Digital Transmission Content Protection; A protocol for protecting digital audio/video content that is traversing a high speed serial bus, such as IEEE-1394
DVB-C	Digital Video Broadcast - Cable
DVB-T	Digital Video Broadcast - Terrestrial
DVD	Digital Versatile Disc
DVI(-d)	Digital Visual Interface (d= digital only)
E-DDC	Enhanced Display Data Channel (VESA standard for communication channel and display). Using E-DDC, the video source can read the EDID information form the display.
EDID	Extended Display Identification Data (VESA standard)
EEPROM	Electrically Erasable and Programmable Read Only Memory
EMI	Electro Magnetic Interference
EPG	Electronic Program Guide
EPLD	Erasable Programmable Logic Device
EU	Europe
EXT	EXTernal (source), entering the set by SCART or by cinches (jacks)
FDS	Full Dual Screen (same as FDW)
FDW	Full Dual Window (same as FDS)
FLASH	FLASH memory
FM	Field Memory or Frequency Modulation
FPGA	Field-Programmable Gate Array
FTV	Flat TeleVision
Gb/s	Giga bits per second
G-TXT	Green TeleteXT
H	H_sync to the module
HD	High Definition
HDD	Hard Disk Drive
HDCP	High-bandwidth Digital Content Protection: A “key” encoded into the HDMI/DVI signal that prevents video data piracy. If a source is HDCP coded and connected via HDMI/DVI without the proper HDCP decoding, the picture is put into a “snow vision” mode or changed to a low resolution. For normal content distribution the source and the display device must be enabled for HDCP “software key” decoding.
HDMI	High Definition Multimedia Interface
HP	HeadPhone
I	Monochrome TV system. Sound carrier distance is 6.0 MHz
I^2C	Inter IC bus
I^2D	Inter IC Data bus
I^2S	Inter IC Sound bus
IF	Intermediate Frequency
IR	Infra Red
IRQ	Interrupt Request
ITU-656	The ITU Radio communication Sector (ITU-R) is a standards body subcommittee of the International Telecommunication Union relating to radio communication. ITU-656 (a.k.a. SDI), is a digitized video format used for broadcast grade video. Uncompressed digital component or digital composite signals can be used. The SDI signal is self-synchronizing, uses 8 bit or 10 bit data words, and has a maximum data rate of 270 Mbit/s, with a minimum bandwidth of 135 MHz.
ITV	Institutional TeleVision; TV sets for hotels, hospitals etc.
LS	Last Status; The settings last chosen by the customer and read and stored in RAM or in the NVM. They are called at start-up of the set to configure it according to the customer's preferences
LATAM	Latin America
LCD	Liquid Crystal Display
LED	Light Emitting Diode
L/L'	Monochrome TV system. Sound carrier distance is 6.5 MHz. L' is Band I, L is all bands except for Band I
LPL	LG.Philips LCD (supplier)
LS	Loudspeaker
LVDS	Low Voltage Differential Signalling
Mbps	Mega bits per second
M/N	Monochrome TV system. Sound carrier distance is 4.5 MHz
MHEG	Part of a set of international standards related to the presentation of multimedia information, standardised by the Multimedia and Hypermedia Experts Group. It is commonly used as a language to describe interactive television services
MIPS	Microprocessor without Interlocked Pipeline-Stages; A RISC-based microprocessor
MOP	Matrix Output Processor
MOSFET	Metal Oxide Silicon Field Effect Transistor, switching device
MPEG	Motion Pictures Experts Group
MPIF	Multi Platform InterFace
MUTE	MUTE Line
MTV	Mainstream TV: TV-mode with Consumer TV features enabled (iTV)
NC	Not Connected
NICAM	Near Instantaneous Compounded Audio Multiplexing. This is a digital sound system, mainly used in Europe.
NTC	Negative Temperature Coefficient, non-linear resistor
NTSC	National Television Standard Committee. Color system mainly used in North America and Japan. Color carrier NTSC M/N= 3.579545 MHz, NTSC 4.43= 4.433619 MHz (this is a VCR norm, it is not transmitted off-air)
NVM	Non-Volatile Memory: IC containing TV related data such as alignments
O/C	Open Circuit
OSD	On Screen Display
OAD	Over the Air Download. Method of software upgrade via RF transmission. Upgrade software is broadcasted in TS with TV channels.
OTC	On screen display Teletext and Control; also called Artistic (SAA5800)
P50	Project 50: communication protocol between TV and peripherals
PAL	Phase Alternating Line. Color system mainly used in West Europe (color carrier= 4.433619 MHz) and South America (color carrier PAL M=

	3.575612 MHz and PAL N= 3.582056 MHz)
PCB	Printed Circuit Board (same as “PWB”)
PCM	Pulse Code Modulation
PDP	Plasma Display Panel
PFC	Power Factor Corrector (or Pre-conditioner)
PIP	Picture In Picture
PLL	Phase Locked Loop. Used for e.g. FST tuning systems. The customer can give directly the desired frequency
POD	Point Of Deployment: a removable CAM module, implementing the CA system for a host (e.g. a TV-set)
POR	Power On Reset, signal to reset the uP
PSDL	Power Supply for Direct view LED backlight with 2D-dimming
PSL	Power Supply with integrated LED drivers
PSLS	Power Supply with integrated LED drivers with added Scanning functionality
PTC	Positive Temperature Coefficient, non-linear resistor
PWB	Printed Wiring Board (same as “PCB”)
PWM	Pulse Width Modulation
QRC	Quasi Resonant Converter
QTNR	Quality Temporal Noise Reduction
QVCP	Quality Video Composition Processor
RAM	Random Access Memory
RGB	Red, Green, and Blue. The primary color signals for TV. By mixing levels of R, G, and B, all colors (Y/C) are reproduced.
RC	Remote Control
RC5 / RC6	Signal protocol from the remote control receiver
RESET	RESET signal
ROM	Read Only Memory
RSDS	Reduced Swing Differential Signalling data interface
R-TXT	Red TeleteXT
SAM	Service Alignment Mode
S/C	Short Circuit
SCART	Syndicat des Constructeurs d'Appareils Radiorécepteurs et Téléviseurs
SCL	Serial Clock I^2C
SCL-F	CLock Signal on Fast I^2C bus
SD	Standard Definition
SDA	Serial Data I^2C
SDA-F	DAta Signal on Fast I^2C bus
SDI	Serial Digital Interface, see “ITU-656”
SDRAM	Synchronous DRAM
SECAM	SEequence Couleur Avec Mémoire. Color system mainly used in France and East Europe. Color carriers= 4.406250 MHz and 4.250000 MHz
SIF	Sound Intermediate Frequency
SMPS	Switched Mode Power Supply
SoC	System on Chip
SOG	Sync On Green
SOPS	Self Oscillating Power Supply
SPI	Serial Peripheral Interface bus; a 4-wire synchronous serial data link standard
S/PDIF	Sony Philips Digital InterFace
SRAM	Static RAM
SRP	Service Reference Protocol
SSB	Small Signal Board
SSC	Spread Spectrum Clocking, used to reduce the effects of EMI
STB	Set Top Box
STBY	STand-BY
SVGA	800 × 600 (4:3)
SVHS	Super Video Home System
SW	Software
SWAN	Spatial temporal Weighted Averaging Noise reduction
SXGA	1280 × 1024
TFT	Thin Film Transistor
THD	Total Harmonic Distortion
TMDS	Transmission Minimized Differential Signalling
TS	Transport Stream
TXT	TeleteXT
TXT-DW	Dual Window with TeleteXT
UI	User Interface
uP	Microprocessor
UXGA	1600 × 1200 (4:3)
V	V-sync to the module
VESA	Video Electronics Standards Association
VGA	640 × 480 (4:3)
VL	Variable Level out: processed audio output toward external amplifier
VSB	Vestigial Side Band; modulation method
WYSIWYR	What You See Is What You Record: record selection that follows main picture and sound
WXGA	1280 × 768 (15:9)
XTAL	Quartz crystal
XGA	1024 × 768 (4:3)
Y	Luminance signal
Y/C	Luminance (Y) and Chrominance (C) signal
YPbPr	Component video. Luminance and scaled color difference signals (B-Y and R-Y)
YUV	Component video

4. Mechanical Instructions

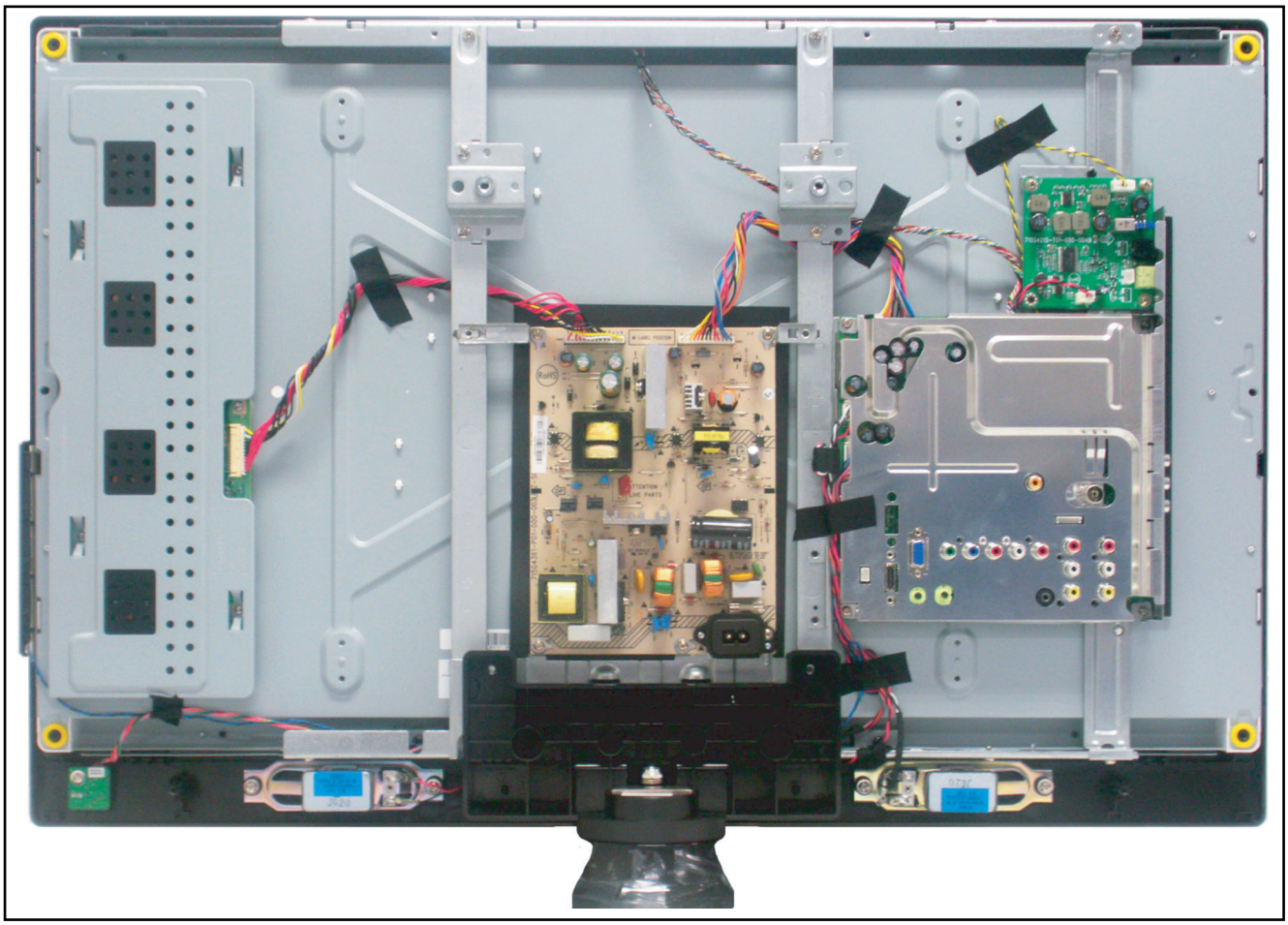
Index of this chapter:

4.1 Cable Dressing
4.2 Service Positions
4.3 Assembly/Panel Removal
4.4 Set Re-assembly.

Notes:

- Figures below can deviate slightly from the actual situation, due to the different set executions.

4.1 Cable Dressing



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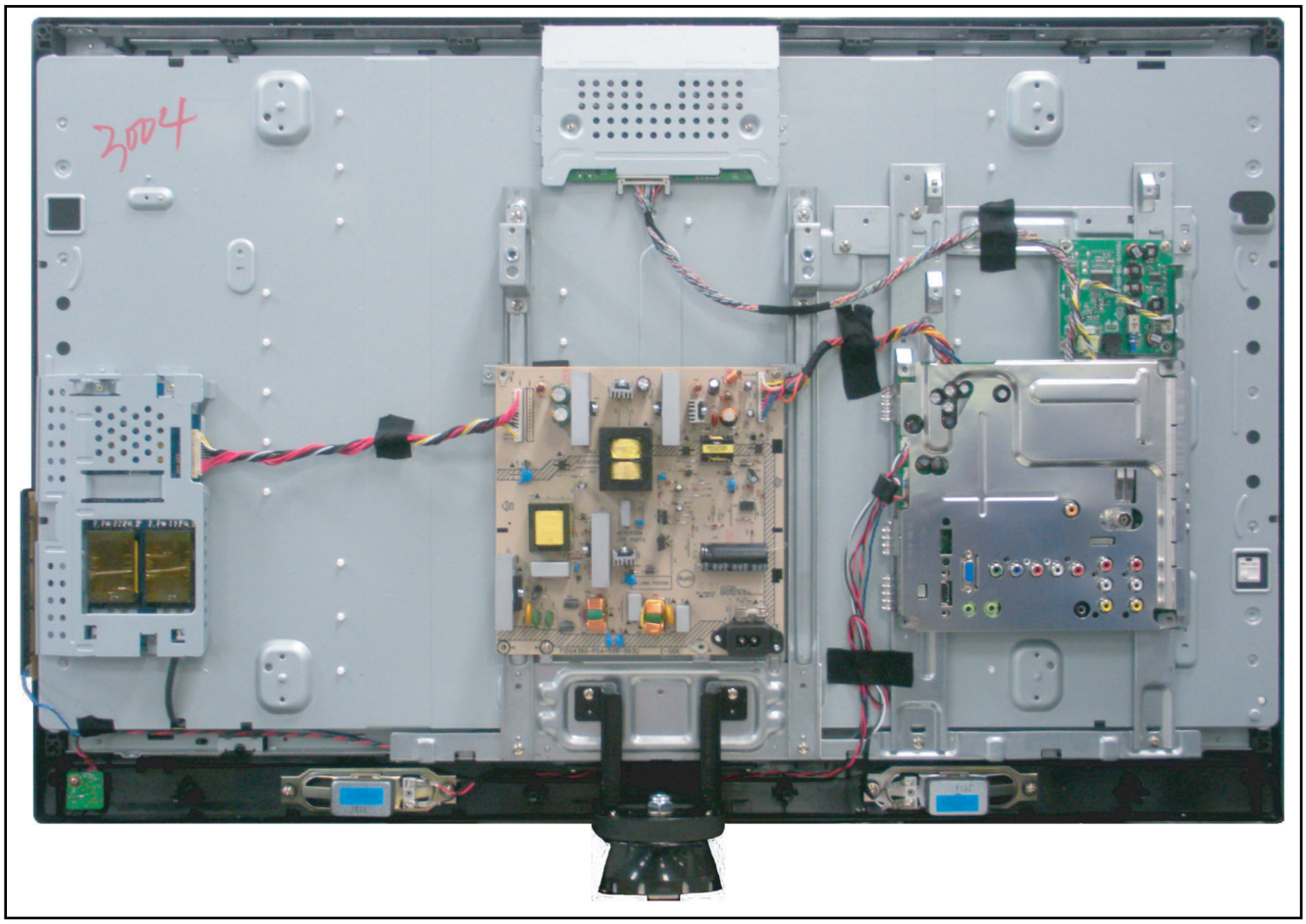
100806

Figure 4-1 Cable dressing (32")



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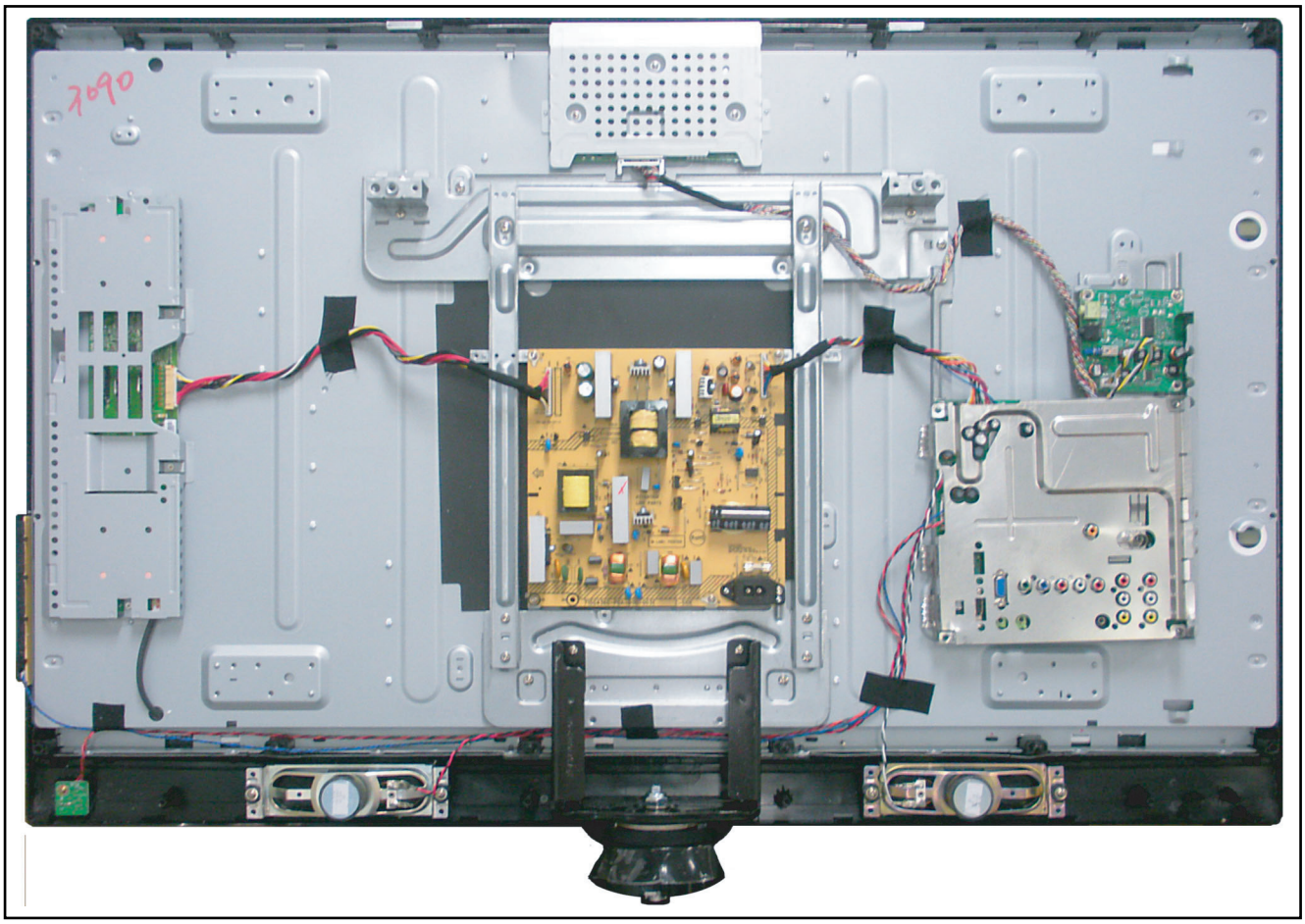
100727

Figure 4-2 Cable dressing (37")



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100727

Figure 4-3 Cable dressing (42")

4.2 Service Positions

For easy servicing of a TV set, the set should be put face down on a soft flat surface, foam buffers or other specific workshop tools. Ensure that a stable situation is created to perform measurements and alignments. When using foam bars take care that these always support the cabinet and **never** only the display. **Caution:** Failure to follow these guidelines can seriously damage the display!
Ensure that ESD safe measures are taken.

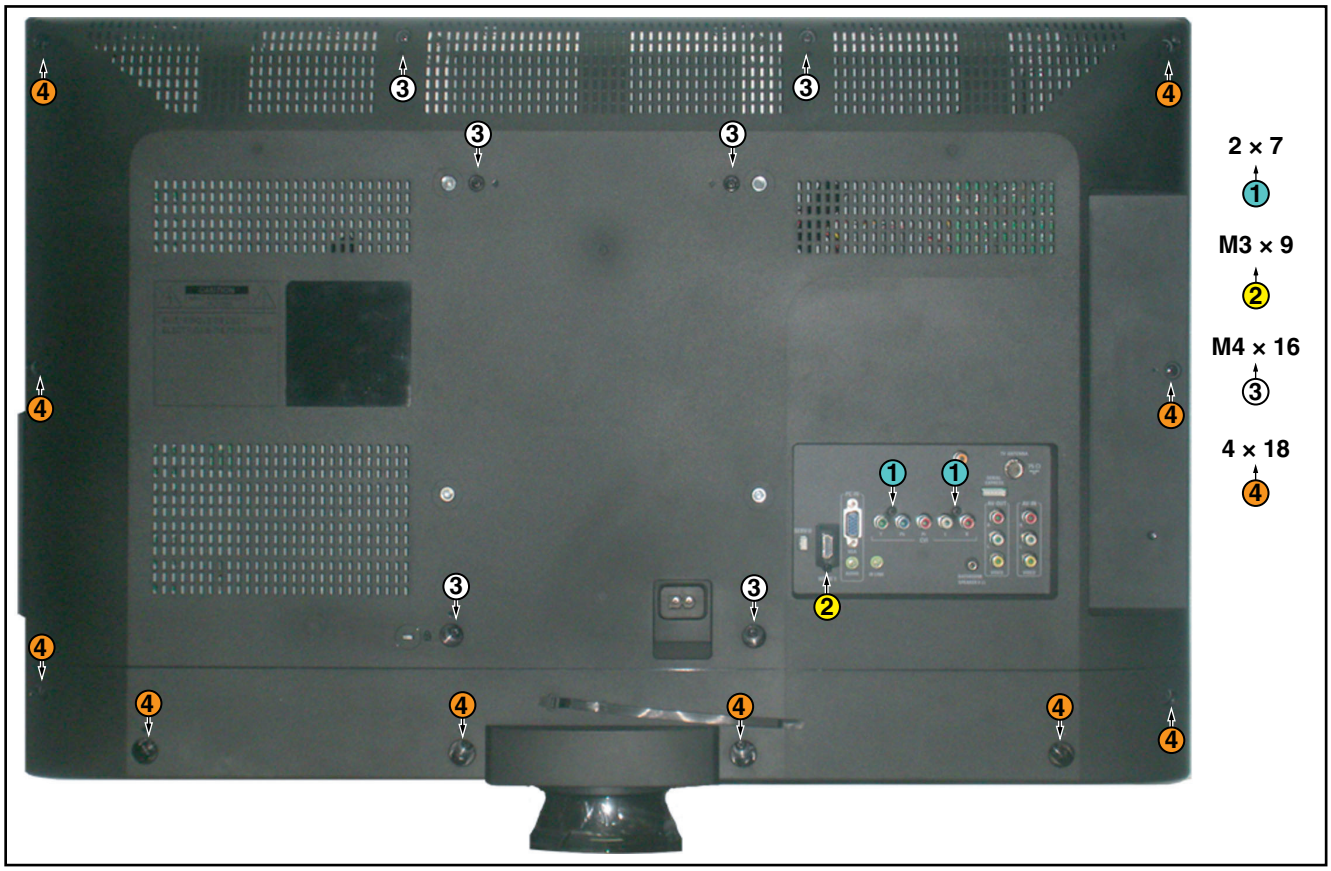
4.3 Assembly/Panel Removal

Instructions below apply to the 32HFL5332/xx, but will be similar for other models.

4.3.1 Rear Cover

Warning: Disconnect the mains power cord before removing the rear cover.
Refer to Figure 4-4 for details.

1. Remove fixation screws that secure the rear cover.
2. Lift the rear cover from the TV. Make sure that wires and flat foils are not damaged while lifting the rear cover from the set.



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100811

Figure 4-4 Rear Cover

4.3.2 Small Signal Board (SSB)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the SSB.

1. Release the tape near the bottom side of the set from the TV panel and release the tape near the left side of the set from the shielding.
2. Remove the fixation screw near the HDMI side inputs.
3. Remove all other fixation screws from the SSB.
4. Remove the shielding from the SSB.
5. Release the clips from the LVDS connector.
   Caution: be careful, as these are very fragile connectors!
6. Release the other cables from their clamps.
7. Unplug all other connectors.
8. Take the SSB out.
   Caution: be careful not to damage the thermal pad at the bottom side of the SSB.

4.3.3 Bathroom Speaker board

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the bathroom speaker board.

1. Release the cable from their clamps.
2. Unplug all connectors from the bathroom speaker board.
3. Remove all fixation screws from the bathroom speaker board.
4. The bathroom speaker board can now be taken out of the set.

When defective, replace the whole unit.

4.3.4 Power Supply Unit (PSU)

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Failure to do so may result in damaging the PSU.

1. Release the Power board cables from their clamps.
2. Unplug power connectors from the SSB and LCD panel.
3. Remove all fixation screws from the PSU.
4. The PSU can now be taken out of the set.

When defective, replace the whole unit.

4.3.5 Stand removal

Caution: it is mandatory to remount all different screws at their original position during re-assembly. Be sure to put the set in the Service Position.

1. Remove the fixation screws.
2. Take the stand out.

4.3.6 Speakers

1. Remove the stand as described earlier.
2. Unplug the speaker connector from the SSB.
3. Release the tape near the bottom middle side of the panel from the TV bezel.
4. Remove all fixation screws from the speaker.
5. Take the speakers out.

When defective, replace the whole unit.

4.3.7 IR/LED Board

1. Remove the fixation screw.
2. Take the board out from the bezel and unplug the connector from the IR/LED board.

When defective, replace the whole unit.

4.3.8 Keyboard Control Panel

1. Unplug the connector on the keyboard control panel.
2. Take the keyboard control panel from the bezel.

When defective, replace the whole unit.

4.3.9 LCD Panel

1. Remove the SSB as described earlier.
2. Remove the bathroom speaker board as described earlier.
3. Remove the PSU as described earlier.
4. Remove the stand as described earlier.
5. Remove the speaker as described earlier.
6. Release the control board cable from its clamps and unplug the control board cable from the control board.
7. Remove the fixation screws that secure the LCD panel with the metal bracket.
8. Lift the LCD Panel from the bezel.

When defective, replace the whole unit.

4.4 Set Re-assembly

To re-assemble the whole set, execute all processes in reverse order.

Notes:

- While re-assembling, make sure that all cables are placed and connected in their original position.
  See Figure 4-1, Figure 4-2 and Figure 4-3.
- Pay special attention not to damage the EMC foams on the SSB shields. Ensure that EMC foams are mounted correctly.

5. Service Modes, Error Codes, and Fault Finding

Index of this chapter:

5.1 Service Modes
5.2 Service Tools
5.3 TV Main Software Upgrading
5.4 Error Codes
5.5 Fault Finding and Repair Tips

5.1 Service Modes

The Customer Service Mode (CSM) is used for communication between the call centre and the customer, while the Service Alignment Mode (SAM) offers several features for the service technician.

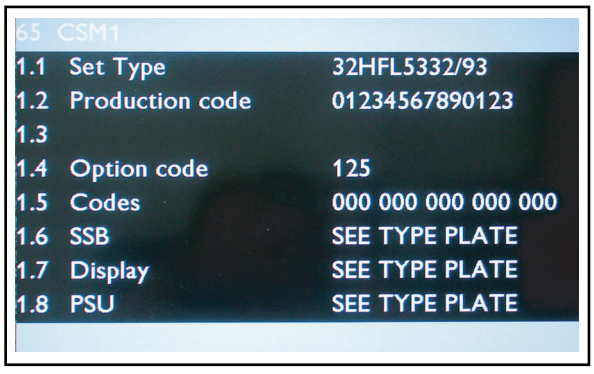
This chassis also offers the option of using ComPair, a hardware interface between a computer and the TV chassis. It offers the abilities of structured troubleshooting, error code reading, and software version read-out for all chassis.

5.1.1 Customer Service Mode (CSM)

Purpose
The Customer Service Mode shows error codes and information on the TV's operation settings.The call centre can instruct the customer (by telephone) to enter CSM in order to identify the status of the set.This helps the call centre to diagnose problems and failures in the TV set before making a service call.
The CSM is a read-only mode; therefore, modifications are not possible in this mode.

How to Activate CSM
Key in the code “123654” via the standard RC transmitter.

Note: Activation of the CSM is only possible if there is no (user) menu on the screen!


65 CSM1
1.1 Set Type 32HFL5332/93
1.2 Production code 01234567890123
1.3
1.4 Option code 125
1.5 Codes 000 000 000 000 000
1.6 SSB SEE TYPE PLATE
1.7 Display SEE TYPE PLATE
1.8 PSU SEE TYPE PLATE

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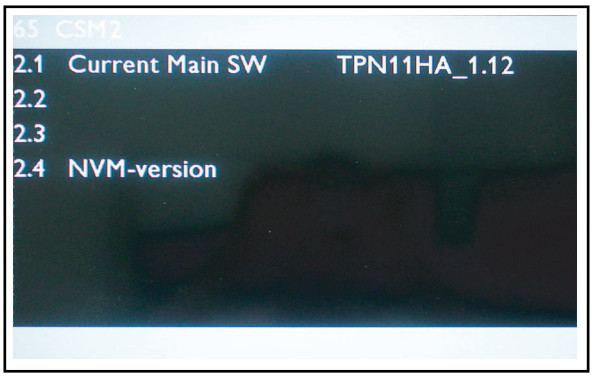
100727

Figure 5-1 CSM Menu [1/3]



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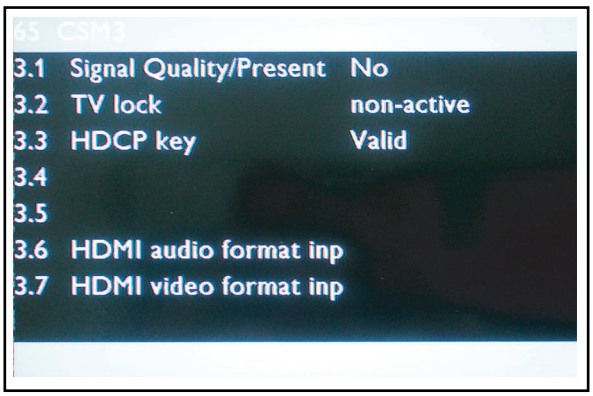
100727

Figure 5-2 CSM Menu [2/3]



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100727

Figure 5-3 CSM Menu [3/3]

How to Navigate
By means of the “CURSOR-DOWN/UP” knob (or the scroll wheel) on the RC-transmitter, can be navigated through the menus.

General
- **1.1 Set Type** NVM read/write (max. 16 characters).
- **1.2 Production code** NVM read/write (max. 16 characters).
- **1.3 Reserved** Not applicable.
- **1.4 Option Code** Store in NVM (set feature grouping as option) panel code.
- **1.5 Codes** Error code Layer 2. Store in NVM. 10 error buffers: 000 = No problem, 011 = I^2C bus error, 012 = tuner error, 013 = panel.
- **1.6 SSB** 12NC NVM read/write (12 characters).
- **1.7 Display** 12NC NVM read/write (12 characters).
- **1.8 PSU** 12NC NVM read/write (12 characters).
- **2.1 Current Main SW** Detects and displays software version.
- **2.2 Reserved** Not applicable.
- **2.3 Reserved** Not applicable.
- **2.4 NVM-version** Detects and displays software version.
- **3.1 Signal Quality/Present** analog/digital signal strength.
- **3.2 TV lock** Detects and displays.
- **3.3 HDCP key** Detects and displays.
- **3.4 Reserved** Not applicable.
- **3.5 Reserved** Not applicable.
- **3.6 HDMI audio format input** Per supported format e.g. Dolby TrueHD, DTS-HD Master Audio, MPCM.

- **3.7 HDMI video format input** Per Supported format. e.g. 576i 50 Hz, 576p 50 Hz, 720p 50 Hz, 1080i 50 Hz, 1080p 50 Hz

How to Exit CSM
Press “MENU” on the RC-transmitter.

5.1.2 Service Alignment Mode (SAM)

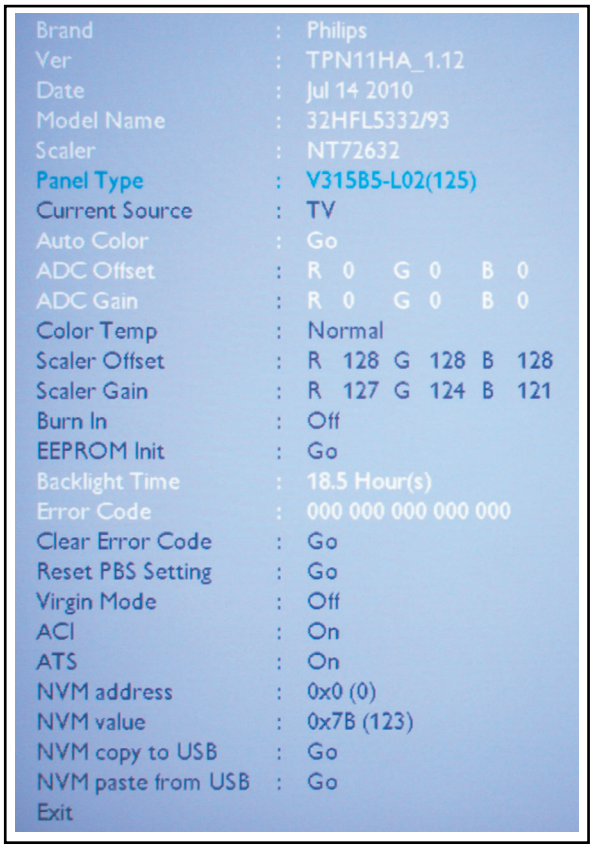
How to enter
To enter the factory mode, use the following method:
- Press the following key sequence on the remote control transmitter: “MENU 1 9 9 9”.

After entering the factory mode, the following screen is visible on the top and right of the panel.

How to Navigate
With the up/down cursor keys can be used to navigate through the menu, while with the Left/Right cursor the values can be changed.

How to EXIT
Choose “EXIT”, and press the “OK” button.

Notes: (only applicable to xxHFL5332/93)
- When the Hotel mode is active, the service modes CSM, SDM, SAM and ComPair are automatically disabled (this is to prevent hotel guests entering Philips service modes).
- In order to use the service modes and ComPair, Hotel mode must be disabled.
- To enable/disable the hotel mode, the hotel setup remote (green remote) is needed.


Brand : Philips
Ver : TPN11HA_1.12
Date : Jul 14 2010
Model Name : 32HFL5332/93
Scaler : NT72632
Panel Type : V315B5-L02(125)
Current Source : TV
Auto Color : Go
ADC Offset : R 0 G 0 B 0
ADC Gain : R 0 G 0 B 0
Color Temp : Normal
Scaler Offset : R 128 G 128 B 128
Scaler Gain : R 127 G 124 B 121
Burn In : Off
EEPROM Init : Go
Backlight Time : 18.5 Hour(s)
Error Code : 000 000 000 000 000
Clear Error Code : Go
Reset PBS Setting : Go
Virgin Mode : Off
ACI : On
ATS : On
NVM address : 0x0 (0)
NVM value : 0x7B (123)
NVM copy to USB : Go
NVM paste from USB : Go
Exit

19020_203_100727.eps
100727

Figure 5-4 Example of SAM

Table 5-1 Contents of SAM

Action Items	Range	Default Value			Description
		32"	37"	42"	
Brand		PHILIPS	PHILIPS	PHILIPS	brand customer
Ver		TPN11HA_1.12	TPN11HA_1.12	TPN11HA_1.12	software version
Date		Jul 14 2010	Jul 14 2010	Jul 14 2010	software release date
Model name		32HFL5332/93	37HFL5382/93	42HFL5382/93	model name
Scaler		NT72634	NT72634	NT72634	scaler IC type
Panel type		V315B5-L02(125)	LC370WUN-SCC1(126)	LC420WUN-SCB1(127)	panel type and display code
Current source		TV	TV	TV	select source
Auto color		GO	GO	GO	PC: any pattern has black and white YPbPr: SMPTEbar (colour bar), any timing.
ADC offset	0 - 255	R 0 G 0 B 0	R 0 G 0 B 0	R 0 G 0 B 0	PC: any pattern has black and white YPbPr: SMPTEbar (colour bar), any timing.
ADC gain	0 - 255	R 0 G 0 B 0	R 0 G 0 B 0	R 0 G 0 B 0	PC: any pattern has black and white YPbPr: SMPTEbar (colour bar), any timing.
Color temp		Normal	Normal	Normal	colour temperature, normal, cool, warm
Scaler offset	0 - 255	R 128 G 128 B 128	R 128 G 128 B 128	R 128 G 128 B 128	Back-End Scaler R G B Gain NVM has YPbPr NORMAL, WARM, COOL, CUSTOMER four sets. Other source use offset with hardcoding
Scaler gain	0 - 255	R 127 G 124 B121	R 127 G 126 B117	R 127 G 128 B123	Back-End Scaler R G B Gain NVM has YPbPr NORMAL, WARM, COOL, CUSTOMER four sets. Other source use offset with hardcoding
Burn in		Off	Off	Off	Puts the set in Burn In mode, for factory use only
EEPROM init		GO	GO	GO	resets the EEPROM to initial mode
Backlight time		x hours	x hours	x hours	the set backlight running time
Error code		000 000 000 000 000	000 000 000 000 000	000 000 000 000 000	error code layer 2. Store in NVM.
Clear error code		GO	GO	GO	clears error code Layer 2. in NVM.
Reset PBS setting		GO	GO	GO	resets the PBS setting
Virgin mode		Off	Off	Off	resets the set to manufacturer's mode
ACI		On	On	On	ACI on or off
ATS		On	On	On	ATS on or off
NVM address		0x0 (0)	0x0 (0)	0x0 (0)	NVM address
NVM value		0x7B (123)	0x7B (123)	0x7B (123)	NVM value NVM
NVM copy to USB		GO	GO	GO	use this to copy the NVM data from the TV to the USB
NVM paste from USB		GO	GO	GO	use this to restore the NVM data from the USB to the TV
Exit	Press OK				Exit from factory mode

5.1.3 Hotel mode

Notes: (only applicable to xxHFLxxxxX/nn)
- Refer to the user manual for more information on the hotel mode.
- When in the hotel mode, the service modes CSM, SDM, SAM and ComPair are automatically disabled (this is to prevent hotel guests entering Philips service modes).
- In order to use the service modes and ComPair, hotel mode must be disabled.
- To enable/disable the hotel mode, the hotel setup remote (green remote) is needed.

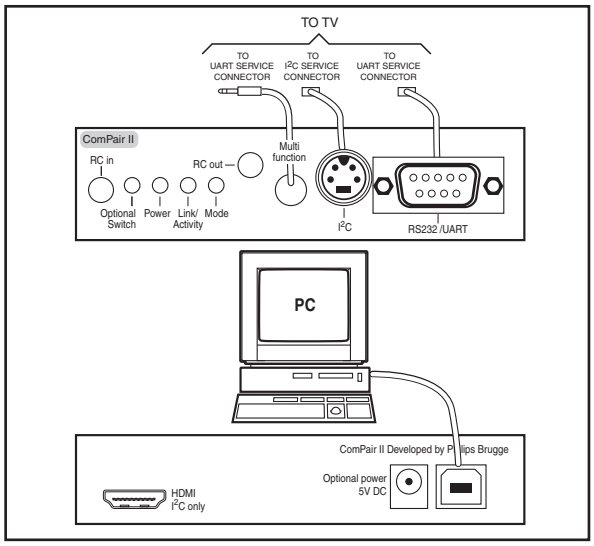
5.2 Service Tools

5.2.1 ComPair

Introduction
ComPair (Computer Aided Repair) is a Service tool for Philips Consumer Electronics products. and offers the following:
1. ComPair helps to quickly get an understanding on how to repair the chassis in a short and effective way.
2. ComPair allows very detailed diagnostics and is therefore capable of accurately indicating problem areas. No knowledge on I²C or UART commands is necessary, because ComPair takes care of this.
3. ComPair speeds up the repair time since it can automatically communicate with the chassis (when the uP is working) and all repair information is directly available.
4. ComPair features TV software upgrade possibilities.

Specifications
ComPair consists of a Windows based fault finding program and an interface box between PC and the (defective) product. The ComPair II interface box is connected **to the PC** via an USB cable. For the TV chassis, the ComPair interface box and the TV communicate via a bi-directional cable via the service connector(s).
The ComPair fault finding program is able to determine the problem of the defective television, by a combination of automatic diagnostics and an interactive question/answer procedure.

How to Connect
This is described in the chassis fault finding database in ComPair.



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091118

Figure 5-5 ComPair II interface connection

Caution: It is compulsory to connect the TV to the PC as shown in the picture above (with the ComPair interface in between), as the ComPair interface acts as a level shifter. If one connects the TV directly to the PC (via UART), ICs will be damaged!

How to Order
ComPair II order codes:
- ComPair II interface: 3122 785 90630.
- Programming software can be downloaded from the Philips Service portal.
- ComPair UART interface cable for TPN1.1HA xx. 3122 785 90630.

Note: While having problems, contact the local support desk.

5.3 TV Main Software Upgrading

5.3.1 Introduction

Philips continuously tries to improve its products, and we recommend that you update the TV software when updates are available. Software update files can be obtained from your dealer or can be downloaded from the Philips servicer network web site (P4S).

Preparing a portable memory for software upgrade
You require the following:
1. A personal computer connected to the Internet.
2. An archive utility that supports the ZIP-format (e.g. WinZip for Windows or StuffIt for Mac OS).
3. A USB flash drive (preferably empty).

Note:
1. Only FAT/DOS-formatted flash drives are supported.
2. Only use software update files that can be found on the Philips servicer network web site (P4S).

5.3.2 Check the current TV software version

Before starting the software upgrade procedure, it is advised to check that what the current TV software:
1. Press the “Menu” button on your remote control.
2. Select “Setup” and press “OK”, then select [Software update] > [Current software].

If the current software version of your TV is the same as the latest update file found on the Philips servicer network web site (P4S), it is not necessary to update the TV software.

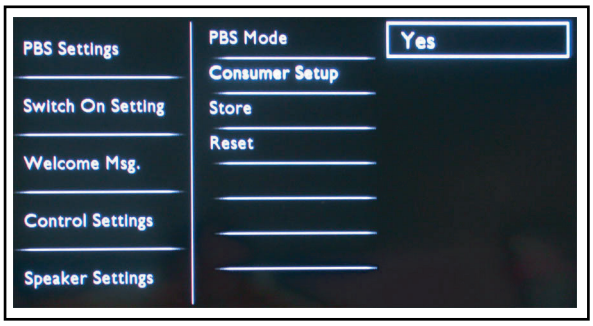
5.3.3 Download the latest software

1. Find the Philips servicer network web site (P4S).
2. Find information and software related to your TV.
3. Select the latest software update file and download it to your PC.
4. Insert a USB flash drive into one of the USB ports of your PC.
5. Decompress the downloaded ZIP file and copy the “autorun.upg” to the root directory of the USB flash drive.

5.3.4 Update the TV software

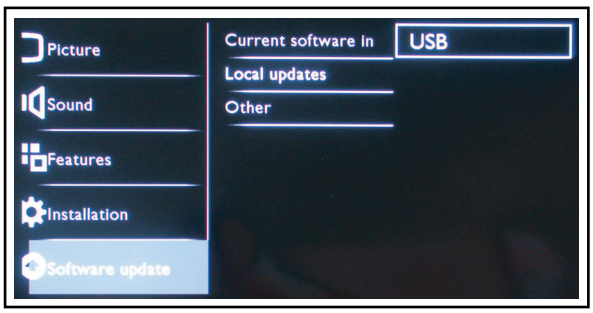
1. Switch off your TV.
2. Insert the USB flash drive that contains the software update file.
3. Switch on your TV.
4. Press MENU on the remote control.
5. Select [PBS Settings] > [Consumer Setup] > [Yes] and press OK. See Figure 5-6.
6. In next menu select [Software update] > [Local updates] > [USB] and press OK. See Figure 5-7.

7. Select [AUTORUN.UPG] and press OK on the remote control. See Figure 5-8.
8. When prompted, select [Cancel] or [Update] and press OK. See Figure 5-9.
9. To proceed, In next menu select [Start] and press OK to start software updates. See Figure 5-10.
10. Upgrading will now begins and the status of the updating progress will be displayed.
11. When the TV software is updated, select [Restart] and press OK to retart the TV. See Figure 5-11.



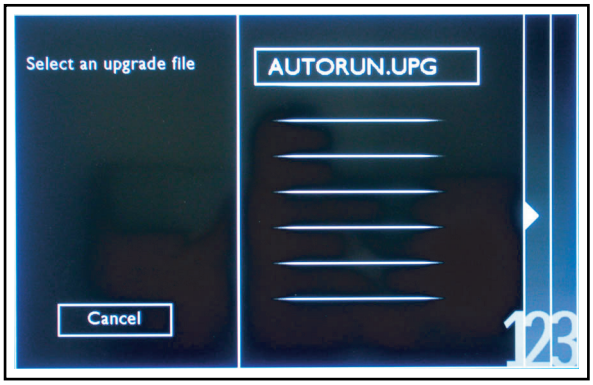
19020_213_100809.eps
100809

Figure 5-6 Update the TV software 1



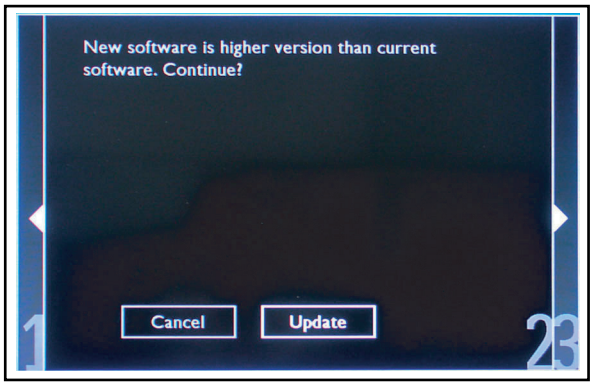
19020_204_100729.eps
100809

Figure 5-7 Update the TV software 2



19020_205_100729.eps
100729

Figure 5-8 Update the TV software 3

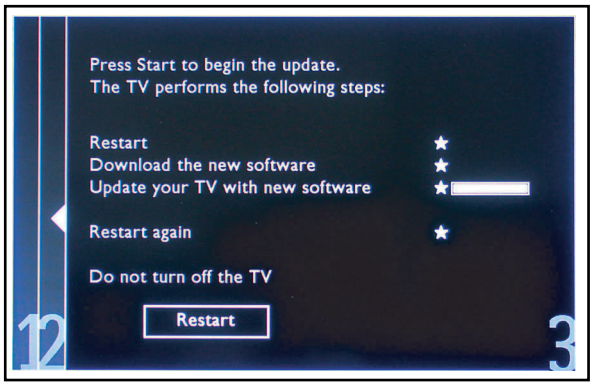


19020_206_100729.eps
100729

Figure 5-9 Update the TV software 4

19020_207_100729.eps
100729

Figure 5-10 Update the TV software 5



19020_208_100729.eps
100729

Figure 5-11 Update the TV software 6

Note:

- Do not remove the USB flash drive during the software update.
- If a power failure occurs during the update, do not remove the USB flash drive from the TV. The TV will continue the software update as soon as power comes back.
- If an error occurs during the update retry the procedure or contact your dealer.
- We do not recommend downgrading to an older version.
- Once the upgrade is finished, use your PC to remove the TV software from your USB portable memory.

5.4 Error Codes

The error code buffer contains all errors detected since the last time the buffer was erased. The buffer is written from left to right. When an error occurs that is not yet in the error code buffer, it is displayed at the left side and all other errors shift one position to the right.

Basically there are three kinds of error codes:

Error Code	Event
000	No problem
011	I^2C bus error
012	Tuner error
013	panel

5.5 Fault Finding and Repair Tips

5.5.1 Speakers

Make sure that the volume is set to minimum during disconnecting the speakers in the ON-state of the TV. The audio amplifier can be damaged by disconnecting the speakers during ON-state of the set!

5.5.2 Tuner

Attention: In case the tuner is replaced, always check the tuner options.

6. Alignments

Index of this chapter:

6.1 General Alignment Conditions
6.2 Hardware Alignments
6.3 Auto Colour for ADC Calibration
6.4 White Balance Adjustment
6.5 Option Settings

Note: The Service Alignment Mode (SAM) are described in chapter 5. Service Modes, Error Codes, and Fault Finding. Menu navigation is done with the CURSOR UP, DOWN, LEFT or RIGHT keys of the remote control transmitter.

6.1 General Alignment Conditions

Perform all electrical adjustments under the following conditions:

- Power supply voltage: 195 - 264 V_{AC}, 50/60 Hz ± 3 Hz.
- Connect the set to the mains via an isolation transformer with low internal resistance.
- Allow the set to warm up for approximately 15 minutes.
- Measure voltages and waveforms in relation to correct ground.
  Caution: It is not allowed to use heatsinks as ground.
- Test probe: R_i > 10 MΩ, C_i < 20 pF.
- Use an isolated trimmer/screwdriver to perform alignments.

6.2 Hardware Alignments

Not applicable.

6.3 Auto Colour for ADC Calibration

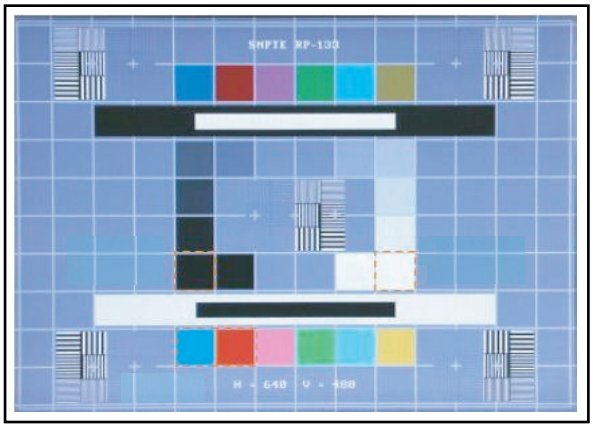
6.3.1 For EXT2(Y/Pb/Pr) source

Equipment requirements:
Use QuantumData 802BT or equivalent equipments.

Input requirements:
Input Signal Type: YPbPr signal

- Set Timing mode at 720p 50 mode.

Pattern:
Apply SMPTE133 Pattern, see Figure 6-1.



18860_204_100507.eps
100806

Figure 6-1 SMPTE133 pattern

Process

1. Press the following key sequence on the remote control transmitter: “MENU 1 9 9 9”, see Figure 6-2.
2. Press ▲, ▼ to move cursor to “Auto Color”.
3. Press Go to do “ADC Gain” and “ADC Offset”.
4. “Exit”.

```
Current Source :  CVI
Auto Color       : Go
ADC Offset       : R xxx   G xxx   B xxx
ADC  Gain        : R xxx   G xxx   B xxx
Color Temp       : Normal
Scaler Offset    : R 128   G 128   B 128
Scaler Gain      : R xxx   G xxx   B xxx
…
Exit
Note: xxx is digit number
```

19020_209_100729.eps
100729

Figure 6-2 OSD in factory mode

6.3.2 For VGA (R/G/B) source

Requirement:

1. Use Chroma 2226 or equivalent equipments.
2. Set Timing mode at 1360 × 768 at 60 Hz.
3. Apply SMPTE-133 pattern, see Figure 6-1. step 1 = Black (0% gray level); step 2 = White (100% gray level).

Process

1. Enter factory mode, then refer to Figure 6-2.

6.4 White Balance Adjustment

6.4.1 General set-up

Equipment requirements:
QuantumData 802BT and CS-200/1000.

Input requirements:
Flat (100% gray level, Full White Pattern).

Input signal timing:
720p 50.

Input Injection Point:
YPbPr input (EXT 2).

Warm-up time:
60 ~ 120 mins @ 25 °C.

Note: The test pattern must always keep same, as well as pattern generation and timing, to avoid “Dynamic Contrast” and “Dynamic Backlight” activited at unknown condition. These parameters are located at “Dig. CrystalClear” of OSD.

6.4.2 Alignment Request in the centre of the screen

Pre-check panel uniformity is OK and Pre-check “White Original Surface Luminance”, Scaler R/G/B gain = 127.

- 32" panel: > 360 cd/m^2.
- 37" panel: > 400 cd/m^2.
- 42" panel: > 400 cd/m^2.

Adjusting “Scaler Gain” in factory mode. The R/G/B gain value should be below 127 to avoid saturation at the 11-step grey pattern.

This group setting of color temp. will be applied automatically in TV / EXT1/VGA/ HDMI / AV source.

Table 6-1 The 1931 CIE chromaticity (x, y) by CA-210

Picture Mode	x	y
Normal (9000K)	0.286 ± 0.010	0.296 ± 0.010
Cool (11000K)	0.273 ± 0.010	0.283 ± 0.010
Warm (6500K)	0.312 ± 0.010	0.326 ± 0.010

If you do not have a colour analyser, you can use the default values. This is the next best solution. The default values are average values coming from production.

- Select a COLOUR TEMPERATURE (e.g. COOL, NORMAL, or WARM).
- Set the RED, GREEN and BLUE default values according to the values in Table 6-2
- When finished press OK on the RC, then press STORE (in the SAM root menu) to store the aligned values to the NVM.
- Restore the initial picture settings after the alignments.

Table 6-2 White tone default settings

Picture Mode	Size	Colour temperature		
		Red	Green	Blue
Normal	32"	127	124	121
	37"	127	126	117
	42"	127	127	123
Cool	32"	121	121	127
	37"	125	127	127
	42"	121	125	127
Warm	32"	127	120	102
	37"	127	118	97
	42"	127	117	98

6.5 Option Settings

6.5.1 Reset Options

In SAM, after reset “Reset option code”, the set immediately restarts.

Table 6-3 Display code overview

CTN_ALT BOM#	Panel Type	Panel ID
32HFL5332/93	CMO V315B5-L02	125
32HFL5332/97	CMO V315B5-L02	125
37HFL5382/93	LG LC370WUN-SCC1	126
42HFL5382/93	LG LC420WUN-SCB1	127

6.5.2 Blind SAM mode

In the blind SAM-mode the display option code of the set can be entered. Use RC command “0 6 2 5 9 8 <MENU> n n n”, where “n n n” is the display option code, see Table 6-3. Upon activating the Blind SAM mode, service technician needs to makesure the CTN and serial number are correctly set inside the TV set (CSM) as per the family sheet sticker on rear cover.

7. Circuit Descriptions

Index of this chapter:

7.1 Introduction
7.2 Power Architecture

Notes:

- Only **new** circuits (circuits that are not published recently) are described.
- Figures can deviate slightly from the actual situation, due to different set executions.
- For a good understanding of the following circuit descriptions, please use the wiring, block (see chapter 9. Block Diagrams) and circuit diagrams (see chapter 10. Circuit Diagrams and PWB Layouts).Where necessary, you will find a separate drawing for clarification.

7.1 Introduction

The TPN1.1HA LA chassis is using the NT72634 for main processing.

7.1.1 TPN1.1HA Architecture Overview

An overview of the TPN1.1HA LA architecture can be found in Figure 7-1.

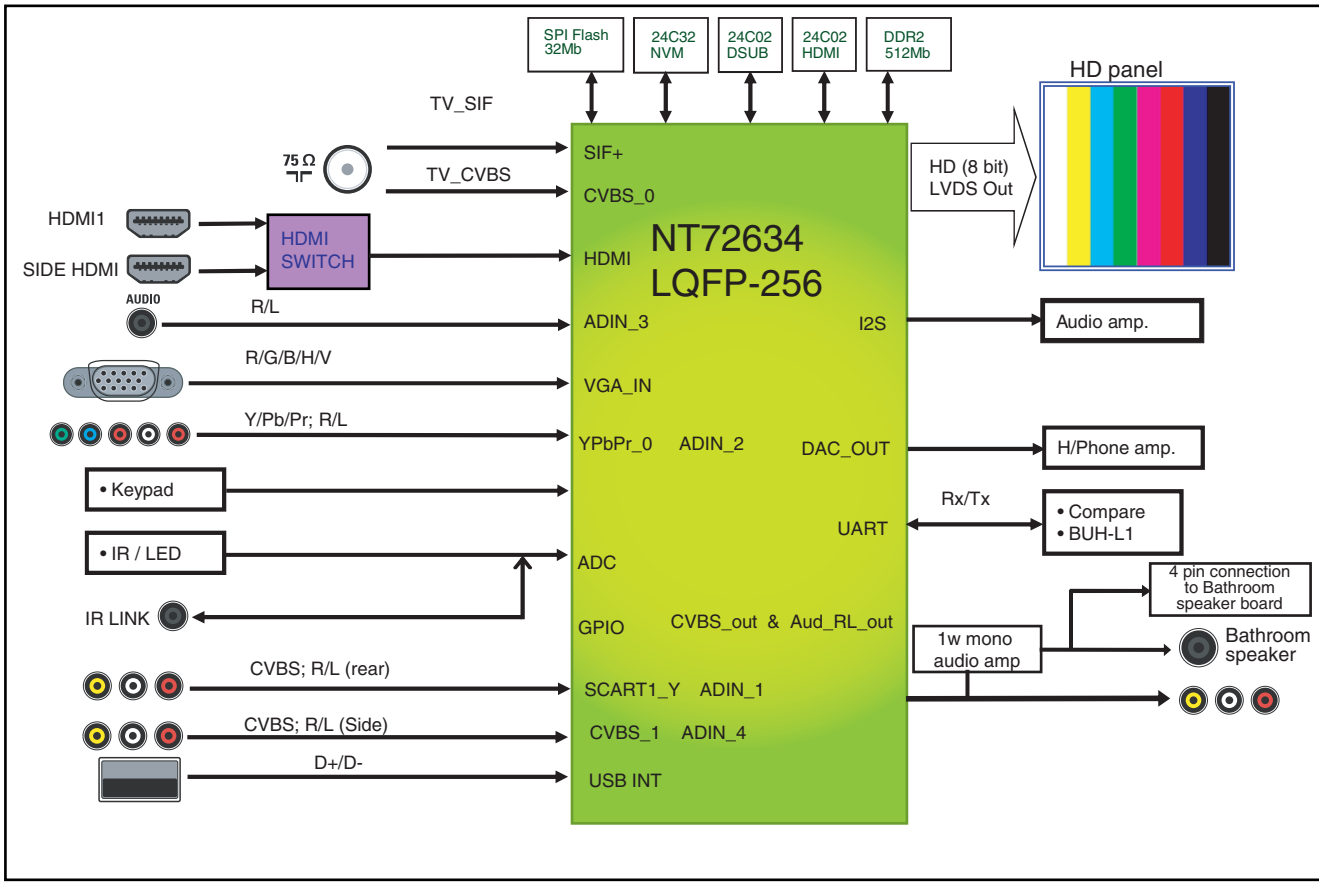


Figure 7-1 Architecture of TPN1.1HA LA

7.1.2 SSB Cell Layout

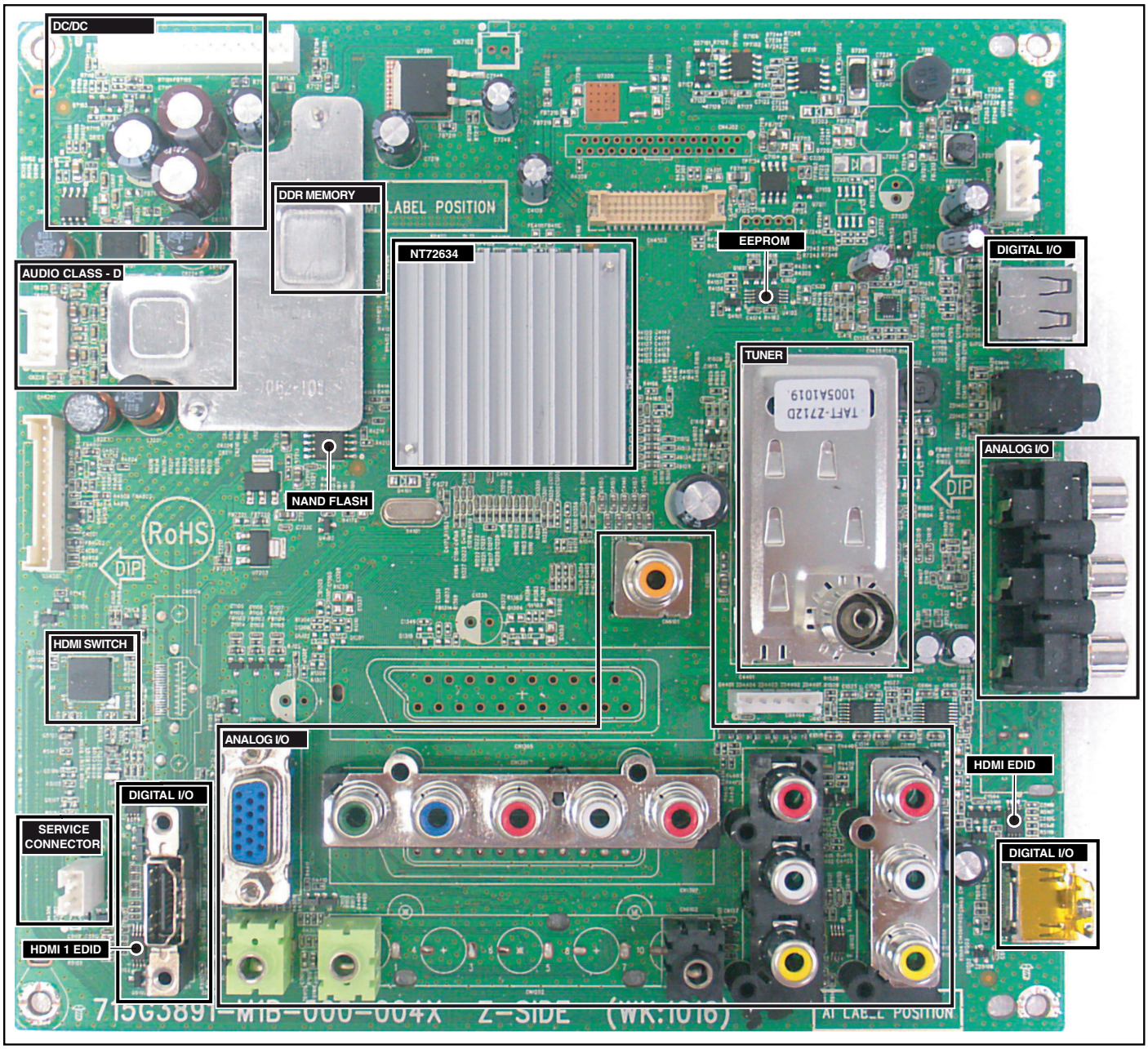


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Figure 7-2 SSB layout cells (top view)

7.2 Power Architecture

Refer to figure Figure 7-3 for the power architecture of this platform (DC/DC power conversion).

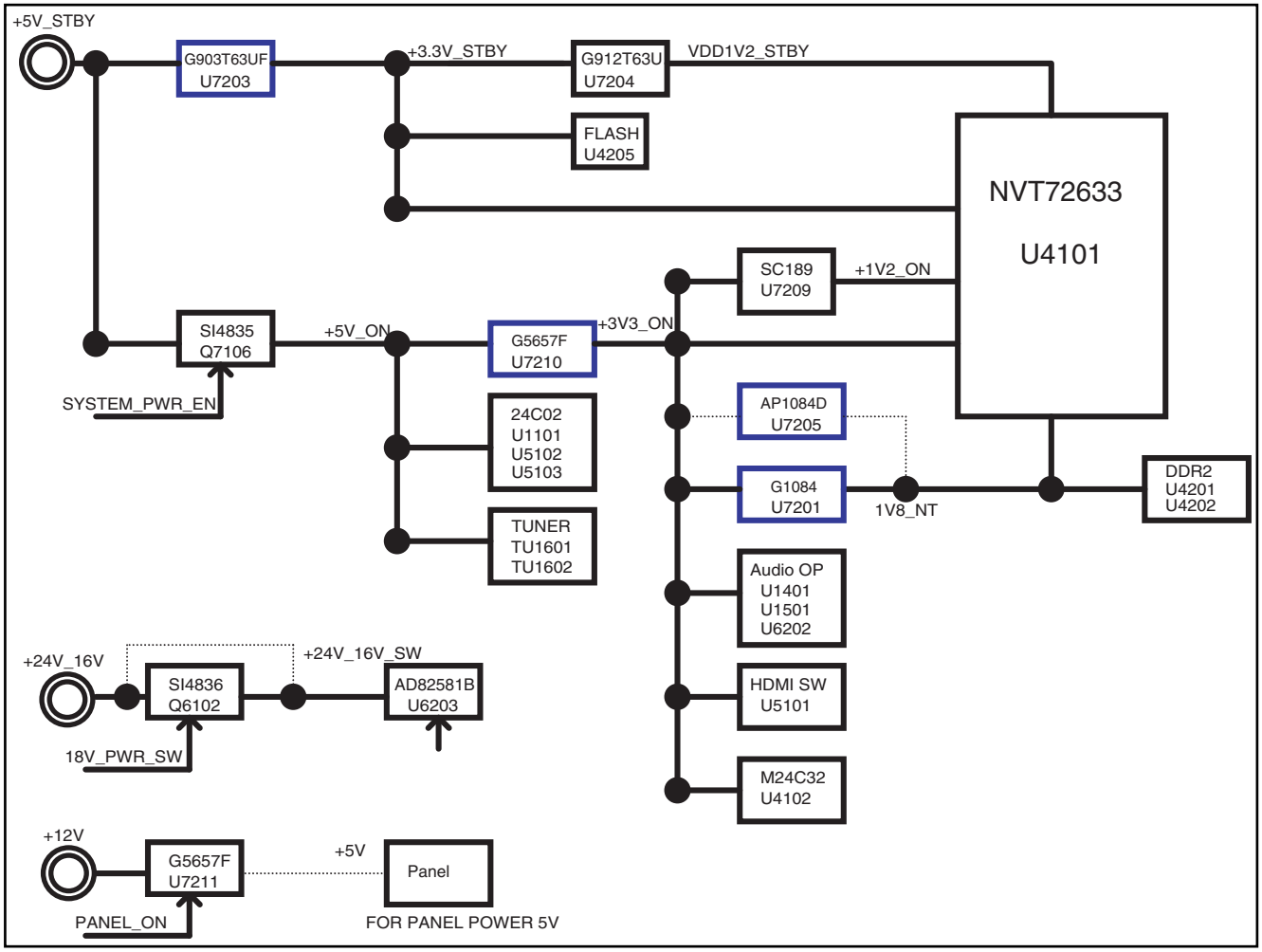

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Figure 7-3 Power Architecture

7.2.1 Power Supply Unit

All power supplies are a black box for Service. When defective, a new board must be ordered and the defective one must be returned, unless the main fuse of the board is broken. Always replace a defective fuse with one with the correct specifications! This part is available in the regular market. Consult the Service website for the order codes of the boards.

The output voltages to the chassis are:

- +5-STANDBY (stand-by-mode only)
- +12V (panel-on)
- +24V (audio power)

8. IC Data Sheets

This section shows the internal block diagrams and pin configurations of ICs that are drawn as “black boxes” in the electrical diagrams (with the exception of “memory” and “logic” ICs).

8.1 Diagram B10 SSB: Scaler NT7263X, NT72634FG/A LQFP-256 (IC U4101)

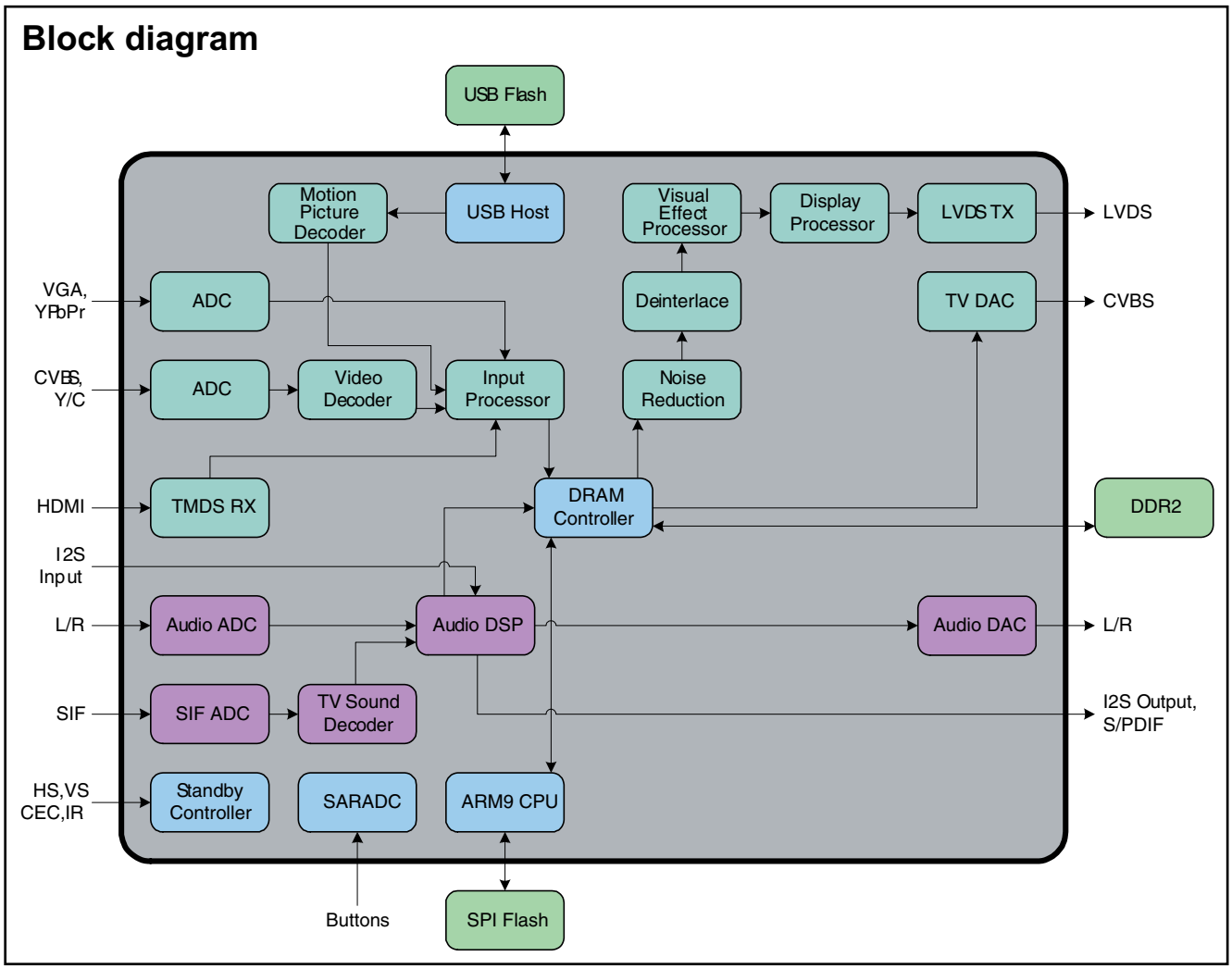

Figure 8-1 Internal block diagram

Pinning information

No	Name	No	Name	No	Name	No	Name
1	MDQ1	65	Ground	129	AUD_VDD	193	VDD_33
2	MDQ6	66	SAR_ADC2	130	AUD_GND	194	VDD_12
3	MDM0	67	SAR_ADC3	131	DAOUT_L0	195	I2SI_BCLK/ AGPIO24
4	MDQ12	68	STBC_RST	132	DAOUT_R0	196	I2SI_ADCDAT(I)/ AGPIO54
5	VDD_DDR	69	PW_EN/ AGPIO56	133	DAOUT_L1	197	I2SI_WS(I)/ AGPIO55
6	MDQ14	70	VGA_VS/ AGPIO60	134	DAOUT_R1	198	I2SO_DAT1/ AGPIO52
7	MDQ9	71	VGA_HS/ AGPIO59	135	DAOUT_L2	199	I2SO_DAT2/ AGPIO53
8	MDQ11	72	XTAL_GND	136	DAOUT_R2	200	Ground
9	MDQS0	73	XTAL_OUT	137	SIF_VDD	201	TEST/ HWRESET#
10	MDQS0#	74	XTAL_IN	138	SIF_IN+	202	MDQ20
11	MDQS1	75	XTAL_VDD	139	SIF_IN-	203	MDQ19
12	MDQS1#	76	SOGIN0	140	SIF_GND	204	VDD_DDR
13	VDD_DDR	77	SOGIN1	141	VDD_33	205	MDQ17
14	MDQ15	78	SOGIN2	142	VDD_12	206	MDQ22
15	MDQ8	79	ADC3VMID	143	S_SCK/ GPIO03(IO)	207	MDM2
16	MDQ10	80	VGA_B	144	S_SDA/ TS_CLK/ AGPIO04	208	MDQ28
17	MDQ13	81	ADC3M	145	PWM0(O)/ GPIO00	209	MDQ30
18	MDM1	82	VGA_G	146	PWM1(O)/ GPIO01	210	MDQ25
19	MDQ7	83	ADC2M	147	PWM2(O)/ GPIO02	211	MDQ27
20	MDQ0	84	VGA_R	148	GPIO05(IO)	212	MDQS2
21	VDD_DDR	85	ADC1M	149	GPIO04(IO)	213	MDQS2#
22	MDQ2	86	ADC1VMID	150	GPIO09(IO)	214	VDD_DDR
23	MDQ5	87	AVDD_TVADC	151	Ground	215	MDQS3
24	Ground	88	AGND_TVADC	152	TS_DAT0/ GPIO07	216	MDQS3#
25	HDCP0_KEY_SDA/ AGPIO00	89	YPbPr0_Pb	153	SPARC_RX/ TS_VALID/ AGPIO05	217	MDQ31
26	HDCP0_KEY_SCK/ AGPIO01	90	YPbPr0_Y	154	SPARC_TX/ TS_START/ AGPIO12	218	MDQ24
27	VDD_33	91	YPbPr0_Pr	155	VDD_33	219	MDQ26
28	VDD_12	92	SCART0_FB	156	VDD_12	220	VDD_DDR
29	VDDHSRT	93	YPbPr1_Pb/ SCART0_B	157	UART0_RX(I)/ AGPIO48	221	MDQ29
30	USB_GND	94	YPbPr1_Y/ SCART0_G	158	UART0_TX(O)/ AGPIO47	222	MDM3

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Figure 8-2 Pin configuration (1)

Pinning information

No	Name	No	Name	No	Name	No	Name
31	REF	95	YPbPr1_Pr/ SCART0_R	159	ICE_TDI/ AGPIO46	223	MDQ23
32	USB_D-	96	SCART0_Y	160	ICE_TDO(GOICE)/ AGPIO43	224	MDQ16
33	USB_D+	97	GND_TVADC	161	ICE_MS/ AGPIO42	225	MDQ18
34	VDDA	98	VDD_TVADC	162	ICE_CLK/ AGPIO44	226	MDQ21
35	USB_GND	99	SCART1_FB	163	ICE_RST/ AGPIO45	227	DDR_VDD12
36	RES_IMP	100	SCART1_B	164	M_SCK/ AGPIO02	228	DDR_GND
37	VDD_HDMI	101	SCART1_G	165	M_SDA/ AGPIO03	229	MCAS#
38	RXACLK-	102	SCART1_R	166	I2SO_MCLK/ AGPIO06	230	MA0
39	RXACLK+	103	SCART1_Y	167	I2SO_BCLK/ AGPIO11	231	DLL0IN
40	RXA0-	104	ADC0M	168	I2SO_WS/ AGPIO10	232	DLL1IN
41	RXA0+	105	S_C	169	I2SO_DAT0/ AGPIO09	233	MA4
42	RXA1-	106	S_Y	170	LVDS_GND	234	MA6
43	RXA1+	107	CVBS1	171	LVDS_B3+	235	MA8
44	RXA2-	108	CVBS0	172	LVDS_B3-	236	VDD_DDR
45	RXA2+	109	FSADJ	173	LVDS_BCLK+	237	MA11
46	GND_HDMI	110	COMP	174	LVDS_BCLK-	238	MA2
47	HDMI_DDC_SCK/ AGPIO16	111	AVDD_TVDAC	175	LVDS_B2+	239	MRAS#
48	HDMI_DDC_SDA/ AGPIO13	112	TV_OUT	176	LVDS_B2-	240	MA9
49	PWR5V/ AGPIO51	113	GND_TVDAC	177	LVDS_B1+	241	MA5
50	HDMI_CEC(IO)/ AGPIO52	114	VDD_12	178	LVDS_B1-	242	MA12
51	STBC_VDD_12	115	VDD_33	179	LVDS_B0+	243	DDR_VREF
52	STBC_VDD_33	116	S/ PDIFO(O)/ GPIO10	180	LVDS_B0-	244	MCLK
53	SPI_WS(IO)/ AGPIO53	117	ADIN_L0	181	LVDS_VCC	245	MCLK#
54	SPI_HOLD(IO)/ AGPIO54	118	ADIN_R0	182	LVDS_A3+	246	MA7
55	SPI_CS	119	ADIN_L1	183	LVDS_A3-	247	MA3
56	SPI_CLK	120	ADIN_R1	184	LVDS_ACLK+	248	VDD_DDR
57	SPI_DI	121	ADIN_L2	185	LVDS_ACLK-	249	MA1
58	SPI_DO	122	ADIN_R2	186	LVDS_A2+	250	MA10
59	MCU_GPIO1	123	ADIN_L3	187	LVDS_A2-	251	MBA0
60	MCU_GPIO0	124	ADIN_R3	188	LVDS_A1+	252	MBA1
61	STBC_IRR(I)/ AGPIO55	125	ADIN_L4	189	LVDS_A1-	253	MWE#
62	RTC_UART_RX(I)/ AGPIO58	126	ADIN_R4	190	LVDS_A0+	254	VDD_DLL
63	RTC_UART_TX(O)/ AGPIO57	127	REFIN	191	LVDS_A0-	255	MDQ4
64	SAR_ADC0	128	VMID	192	LVDS_GND	256	MDQ3

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Figure 8-3 Pin configuration (2)

8.2 Diagram B19 SSB: DC-DC Power, G5657F12U (IC U7210)

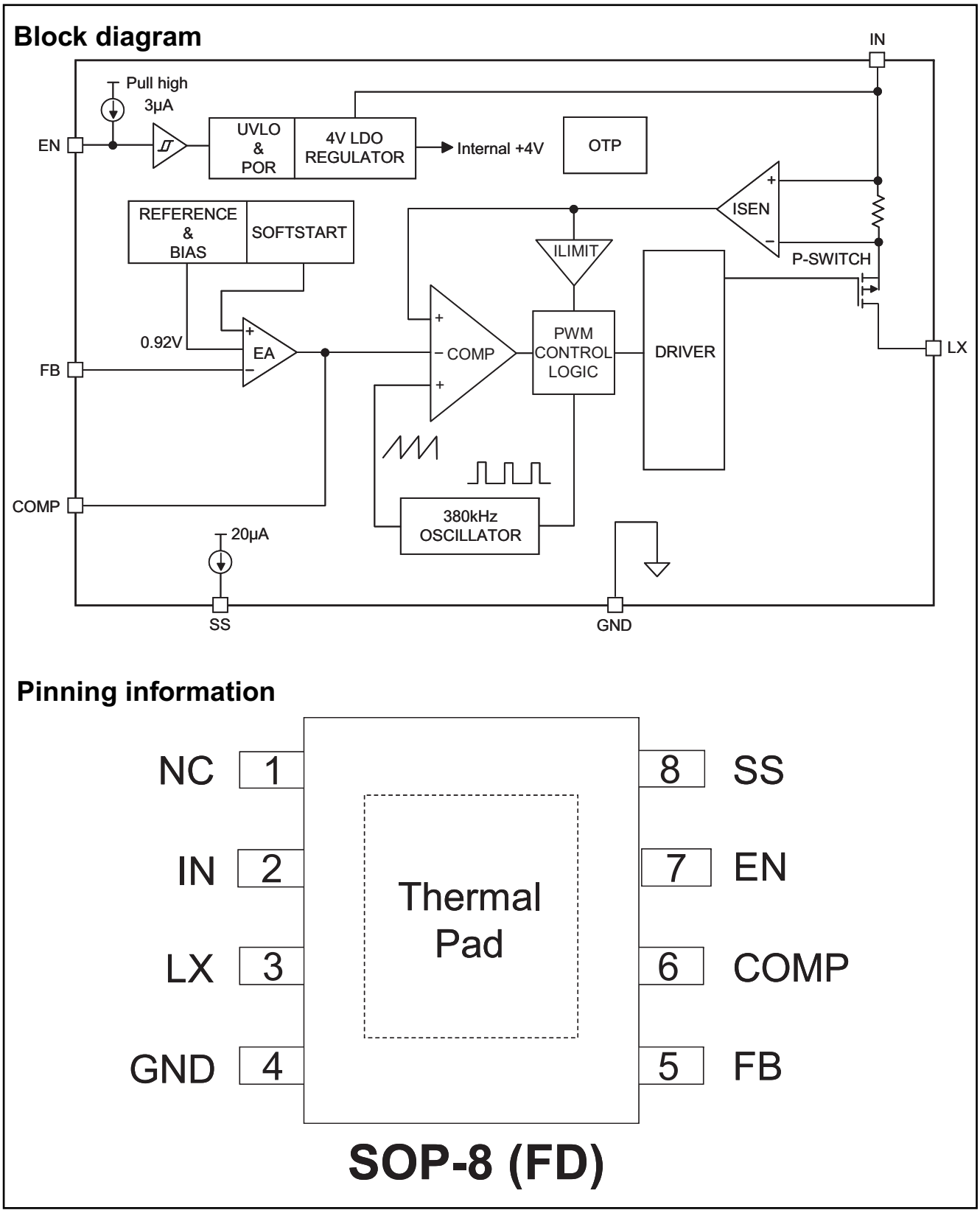

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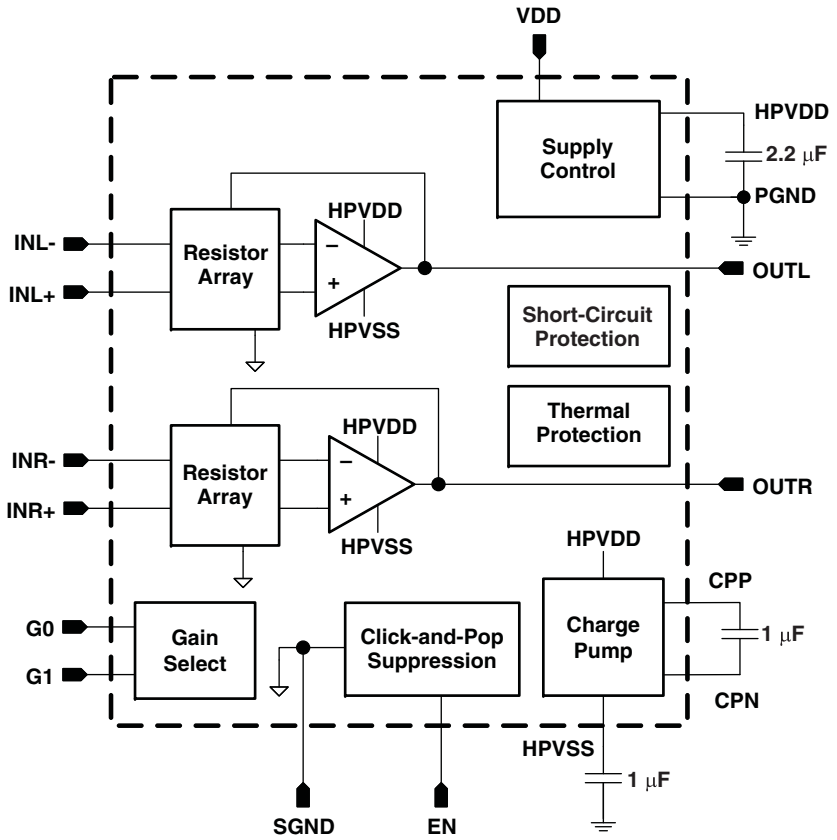
Figure 8-4 Internal block diagram and pin configuration

8.3 Diagram B05 SSB: Side input, TPA6132A2RTER 25mW QFN-16 (IC U1401)

Block diagram



Pinning information

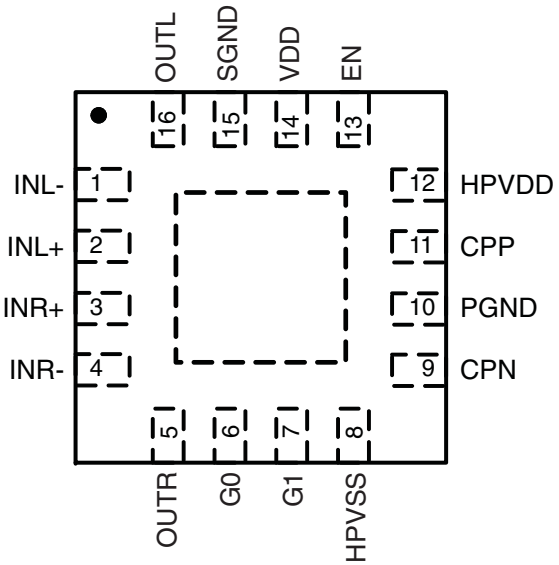


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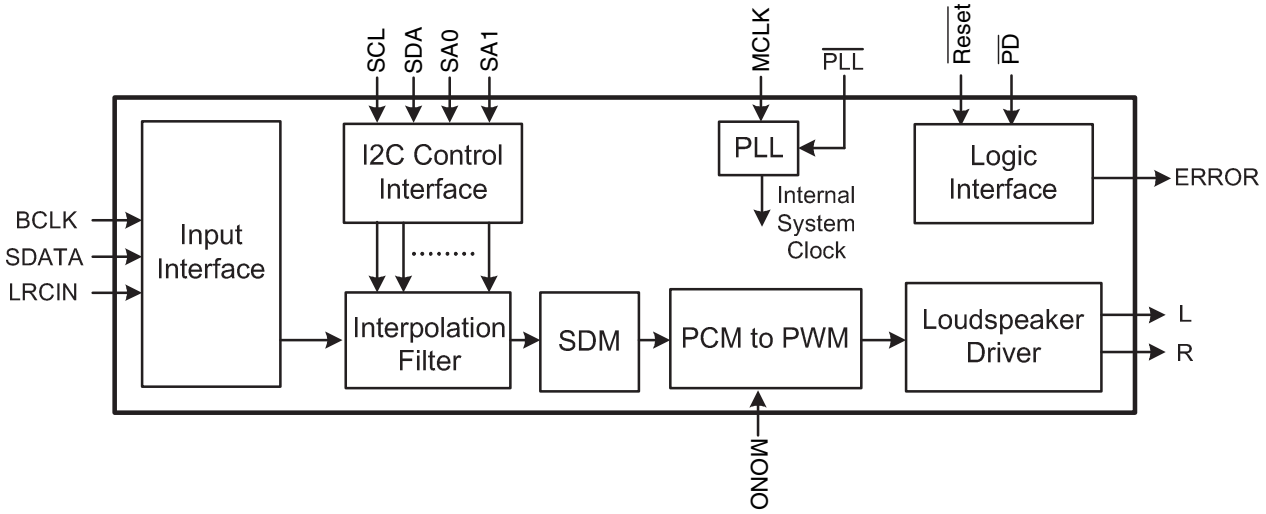
Figure 8-5 Internal block diagram and pin configuration

8.4 Diagram B17 SSB: Audio amplifier, AD82581B-TKG TQFN-48 12W (IC U6202)

Block diagram



Pinning information

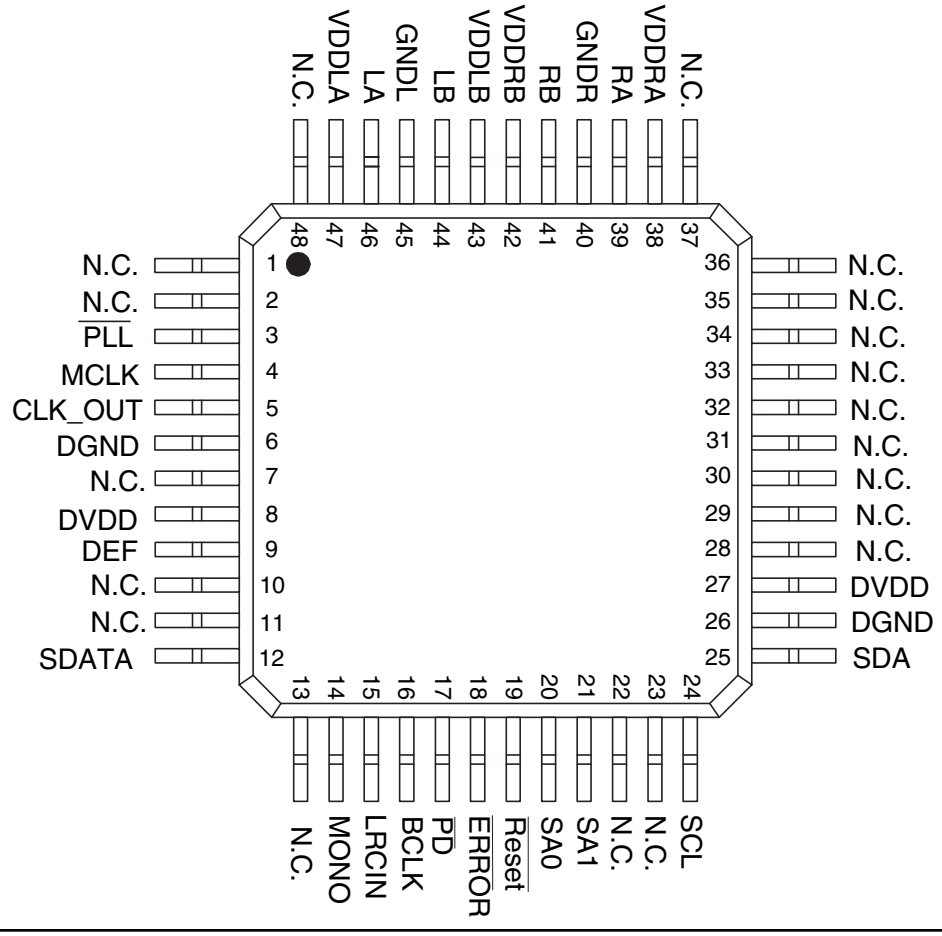


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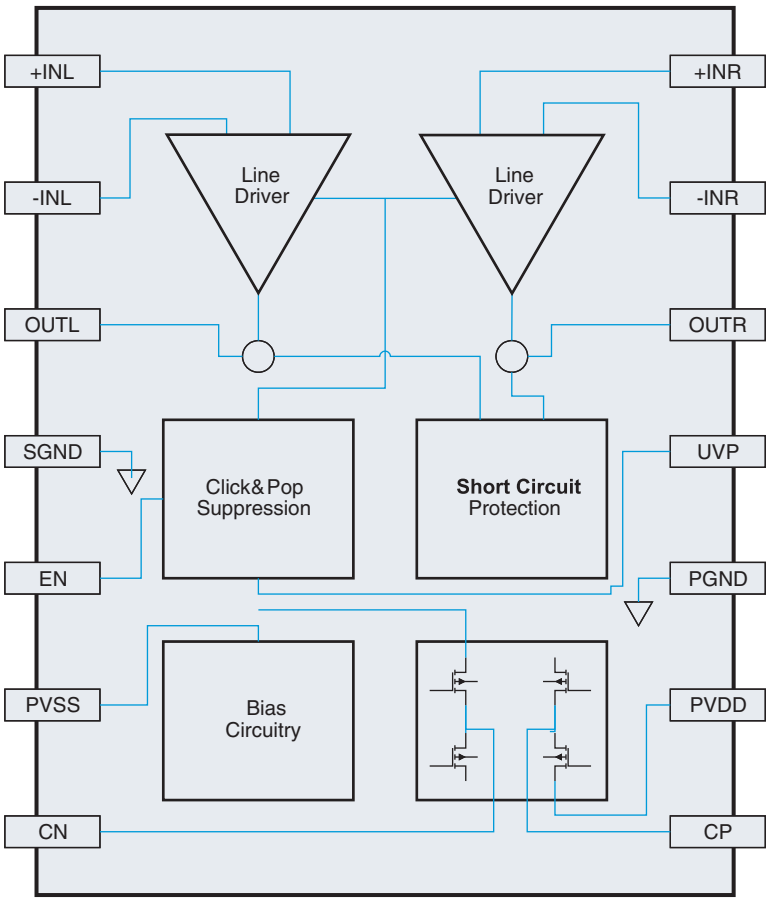
Figure 8-6 Internal block diagram and pin configuration

8.5 Diagram B06 SSB: CVBS audio out, DRV603PWR 870mW TSSOP-14 (IC U1501)

Block diagram



Pinning information

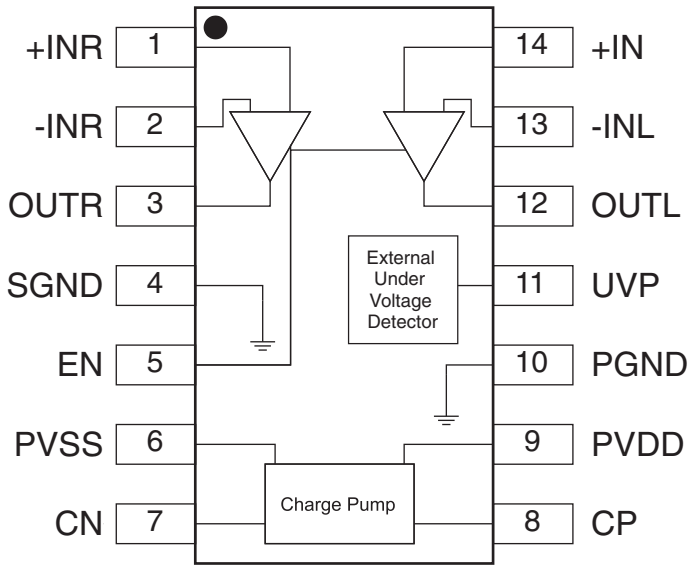


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Figure 8-7 Internal block diagram and pin configuration

8.6 Diagram B08 SSB: HDMI input, PI3HDMI301ZLEX QFN-64 (IC U5101)

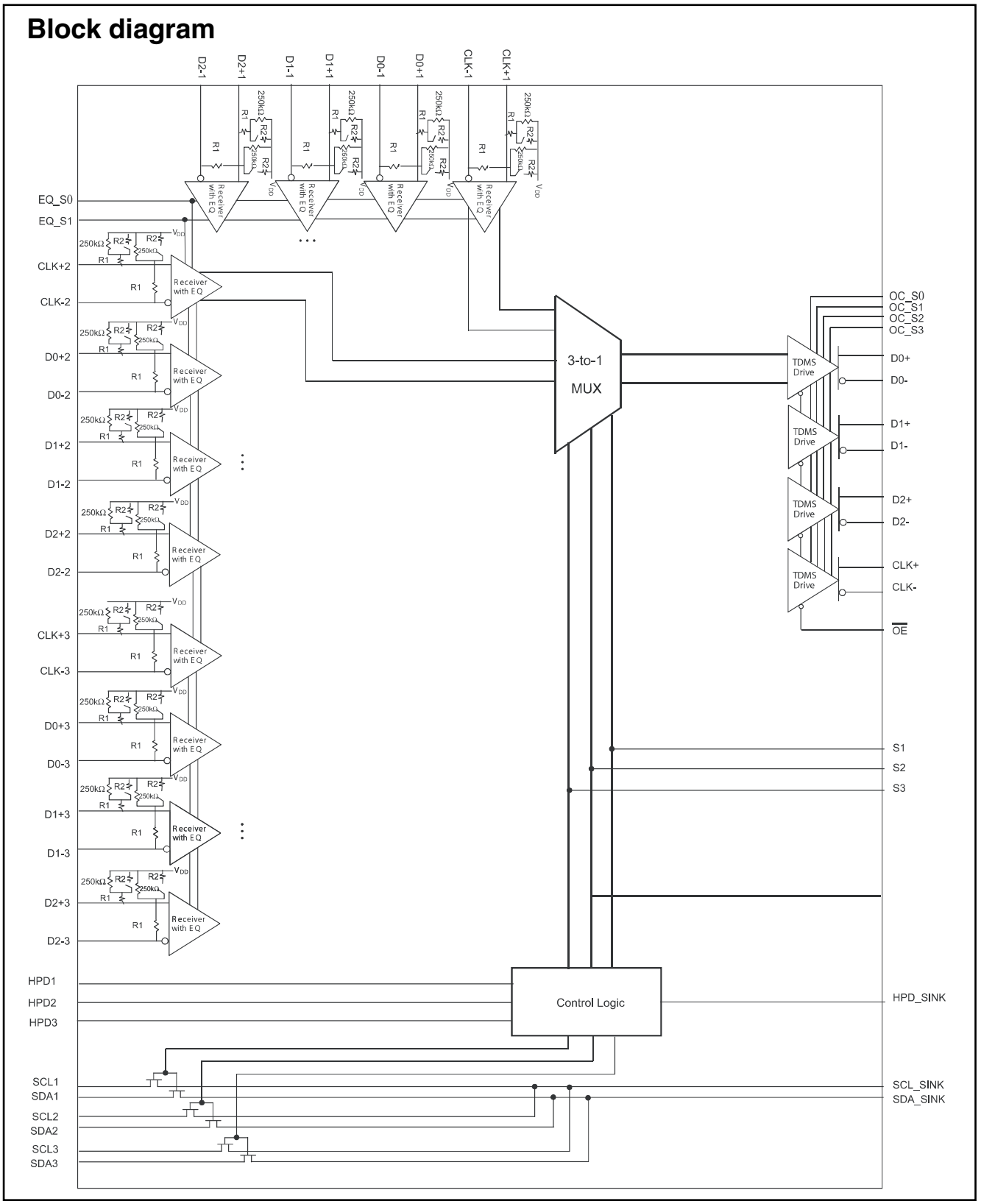

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Figure 8-8 Internal block diagram

Pinning information

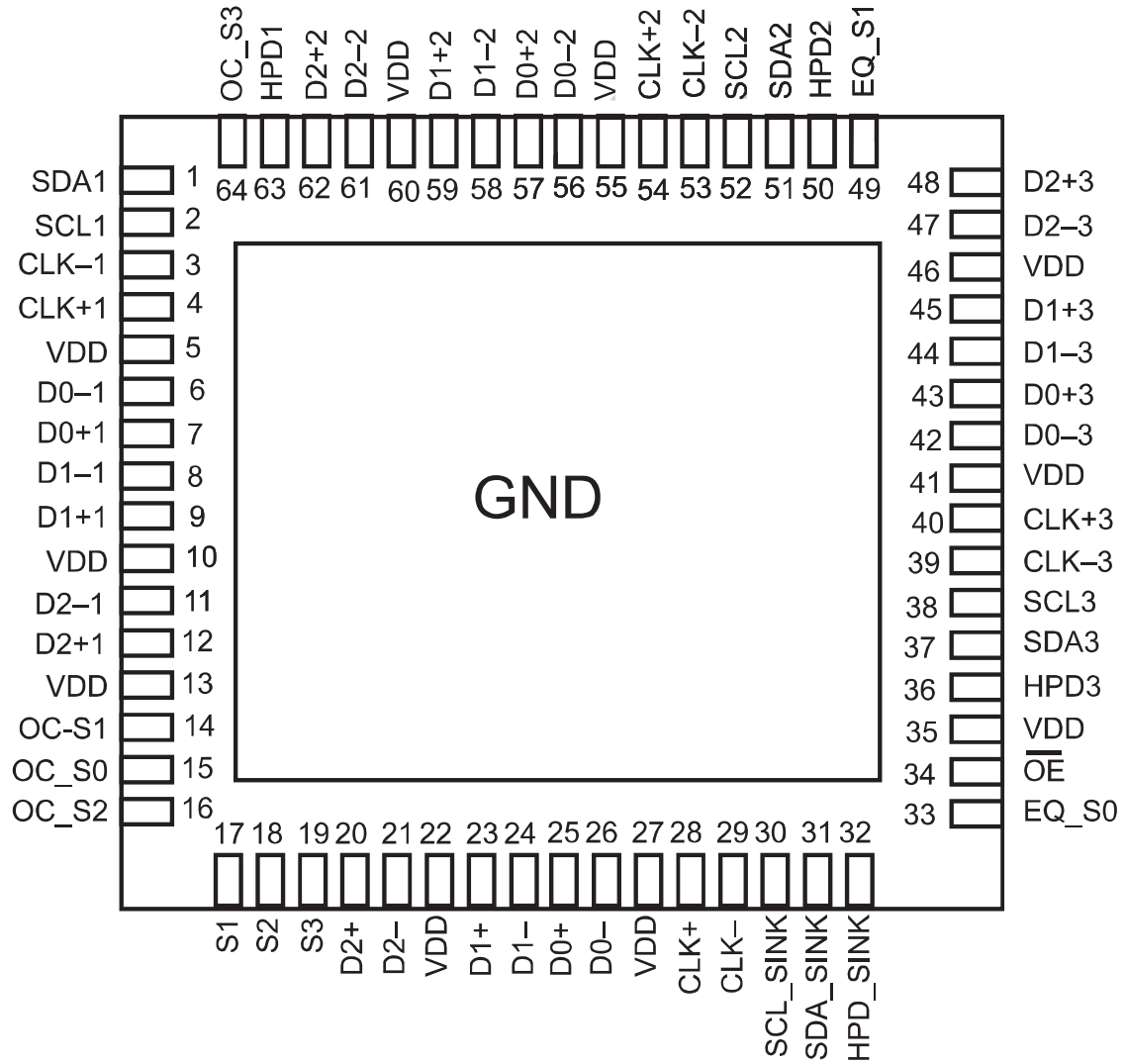

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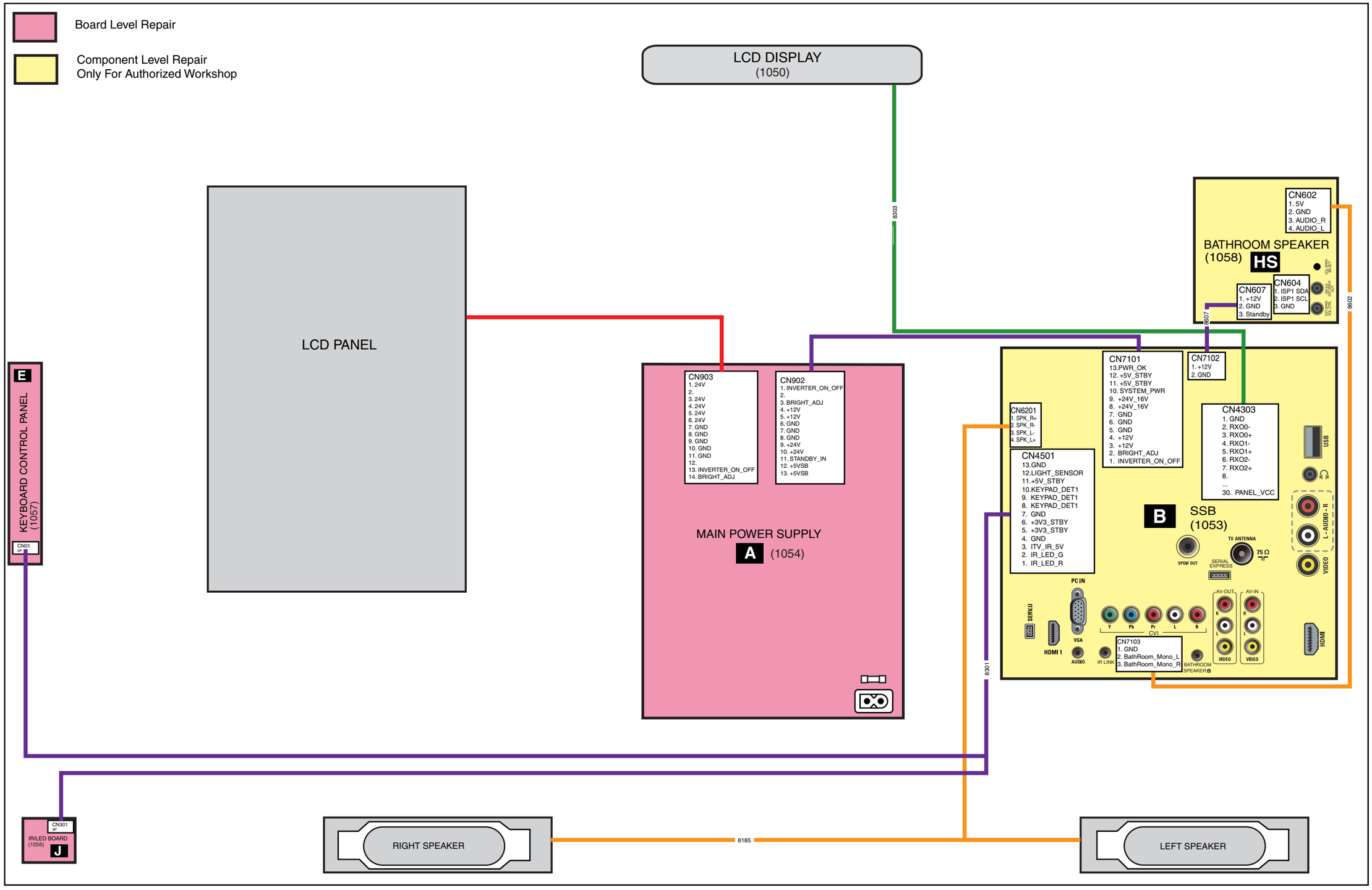
Figure 8-9 Pin configuration

9. Block Diagrams

Wiring Diagram 32"

WIRING DIAGRAM 32" (Pro Plus)



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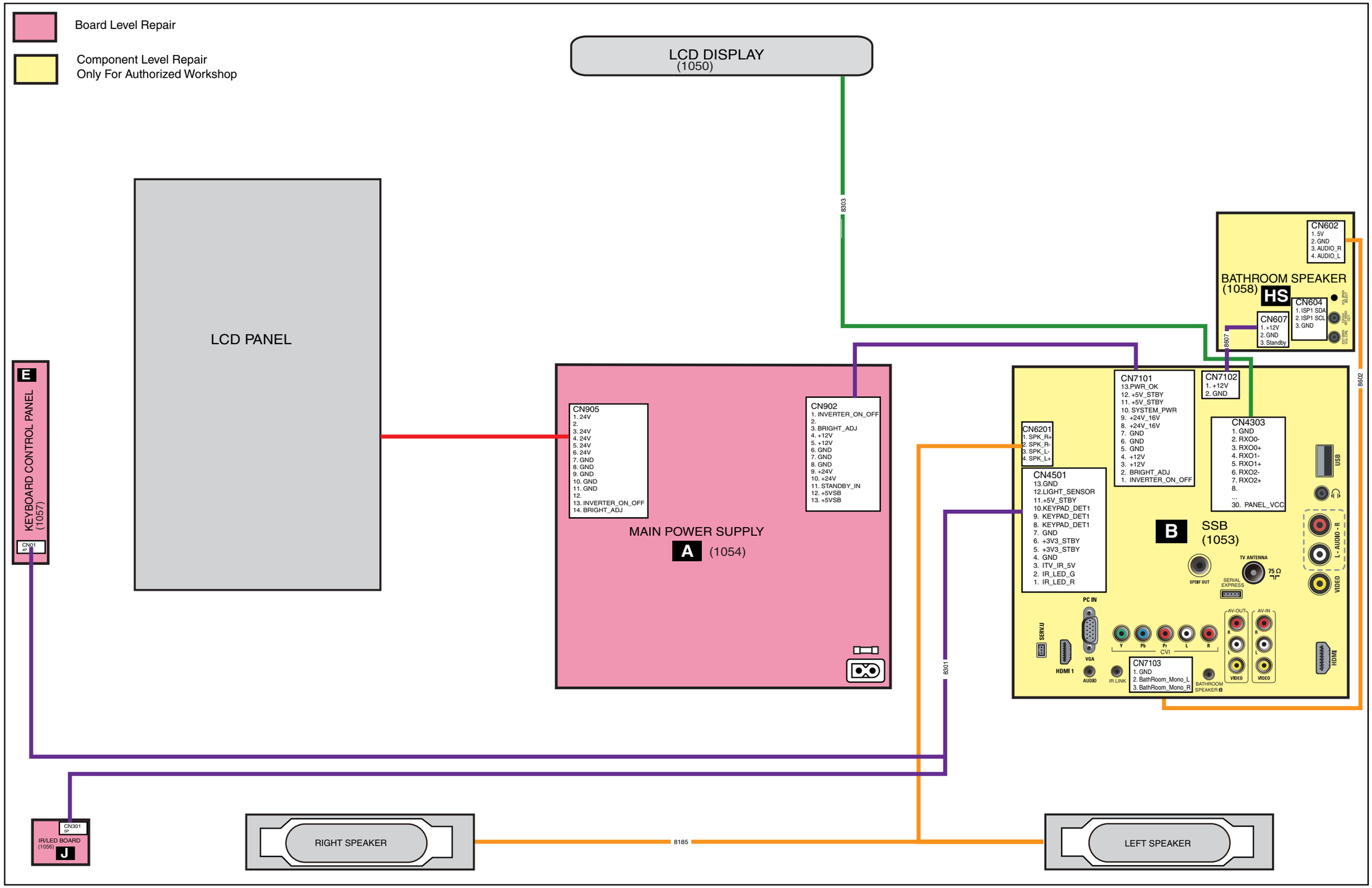
Wiring Diagram 37", 42"

WIRING DIAGRAM 37", 42" (Pro Plus)



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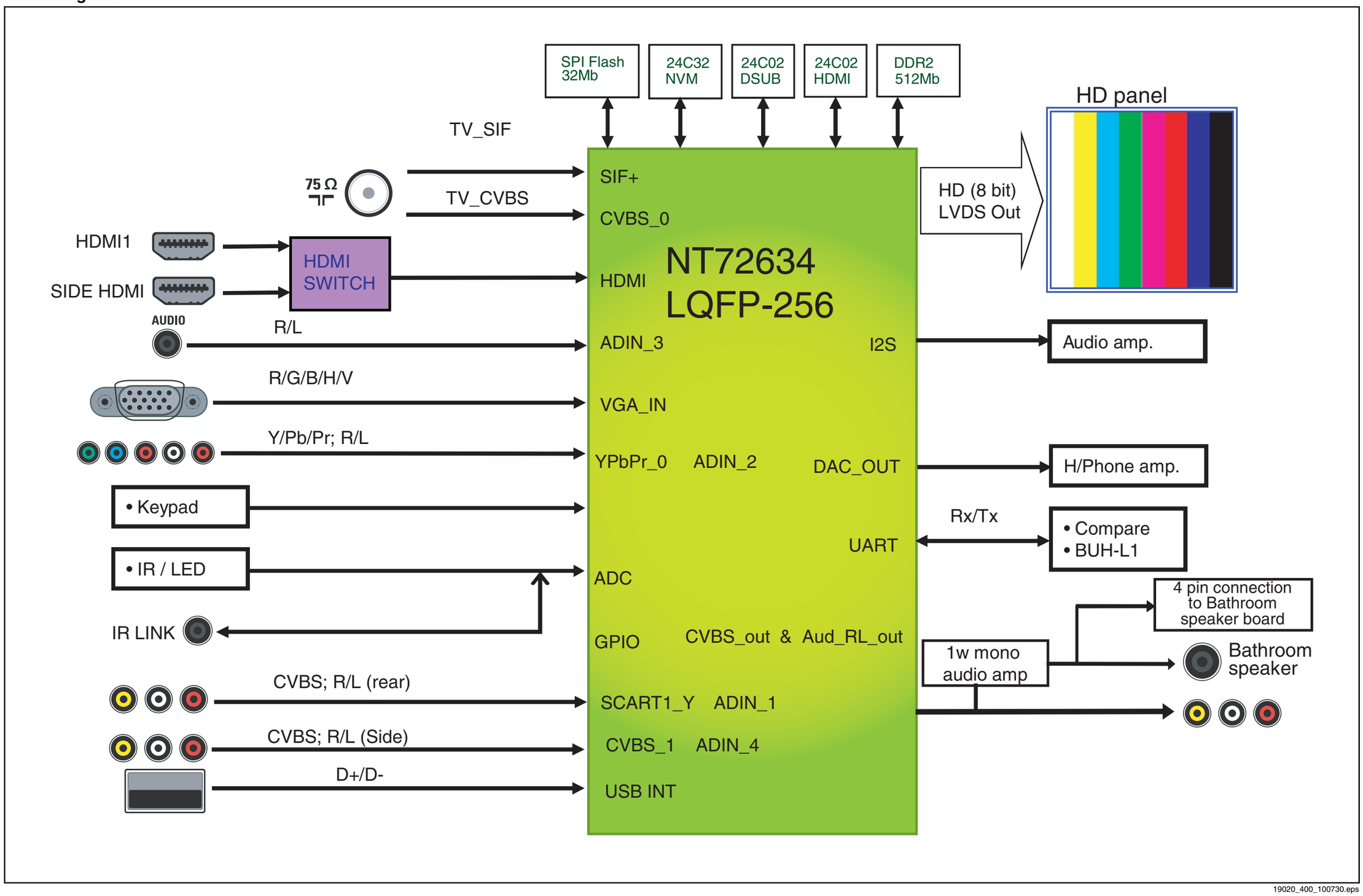
Block Diagram



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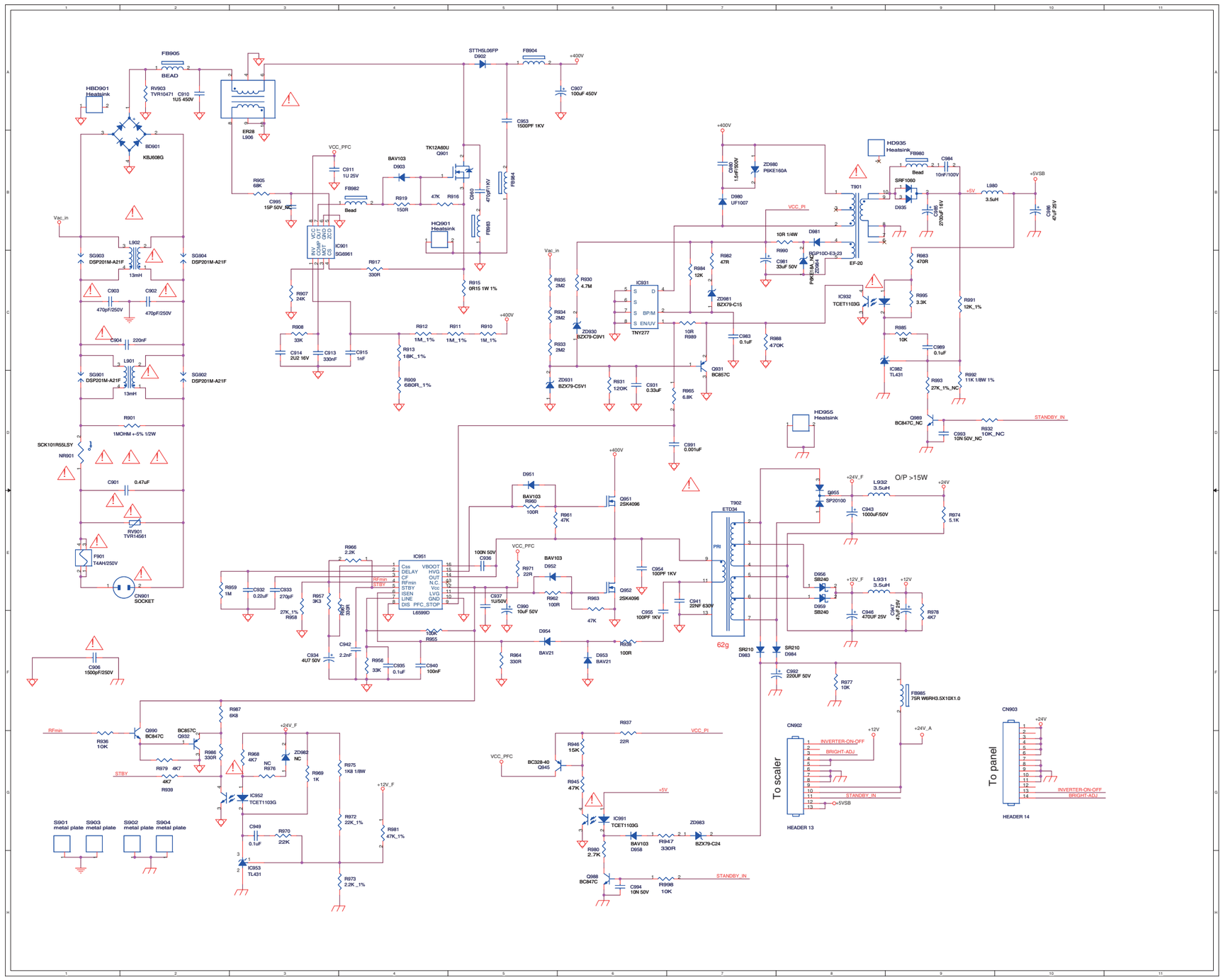
10. Circuit Diagrams and PWB Layouts

Power Board: 32"

A01 Adapter

A01



BD901 A1 CN901 E1
CN902 G8 CN903 F10
C901 D2 C902 C2
C903 C1 C904 C2
C905 A2 C906 F1
C907 A5 C908 F1
C909 B4 C910 B3
C911 B3 C912 C4
C913 C3 C914 C3
C915 C4 C916 B3
C931 D6 C932 E3
C933 E3 C934 F3
C935 F4 C936 E5
C937 E5 C938 F4
C939 E5 C940 F5
C941 F6 C942 G2
C943 E8 C944 E9
C945 E9 C946 E8
C947 E9 C948 G3
C949 G3 C951 A7
C952 F5 C953 A6
C954 E6 C956 F8
C957 G9 C958 G8
C959 A8 C960 B5
C980 B7 C981 C7
C982 C7 C983 C7
C984 B9 C985 B9
C986 B10 C987 H6
C989 C9 D902 A5
D903 B4 D914 F9
D935 B9 D951 D5
D952 E5 D955 D8
D956 E8 D980 B7
D981 B7 D982 A8
FB902 A2 FB904 A5
FB905 A6 FB980 B9
F901 E1 F902 E1
F903 E9 HBD901 A1
HD902 A4 HD935 A9
HD955 D7 HQ901 B5
HQ951 D6 HQ952 D6
IC901 B3 IC931 C6
IC932 C8 IC951 E4
IC952 G2 IC953 G3
IC982 C8 IC991 G6
L901 C2 L902 B2
L903 A2 L904 B1
L905 B2 L906 A3
L931 E8 L971 D8
L980 B9 NR901 D1
Q901 B4 Q931 C6
Q945 G5 Q951 E6
Q952 E5 Q988 G6
Q992 D10 Q993 D9
RV901 E2 RV902 A6
RV903 E1 R901 D2
R902 D2 R903 D1
R905 B3 R906 B3
R907 C3 R908 C3
R909 D4 R910 C5
R911 C4 R912 C4
R913 C4 R915 C5
R916 B4 R917 C4
R918 B4 R919 B4
R930 B6 R931 D6
R933 C5 R934 C5
R935 C5 R936 E5
R937 G5 R945 G6
R950 D10 R953 D4
R954 E4 R955 E4
R956 F4 R957 E3
R958 E3 R959 E2
R960 E5 R961 E5
R962 E5 R963 E6
R964 F5 R965 F6
R966 E3 R967 G2
R968 G3 R969 G3
R970 G3 R971 G4
R972 G3 R973 H3
R974 E9 R975 E9
R976 E9 R977 G9
R980 G6 R981 G4
R982 C7 R983 C9
R984 C7 R985 C9
R986 C10 R987 C10
R988 C7 R989 G1
R990 C9 R991 C9
R992 C9 R993 D9
R994 H6 R995 C9
R996 B8 R997 G8
R998 B7 R999 C7
SG901 C1 SG902 C2
SG903 B1 SG904 B2
SG905 E1 T901 B8
T902 E7 ZD930 C6
ZD931 D5 ZD935 G5
ZD937 G4 ZD965 C10
ZD966 C10 ZD967 H2
ZD980 B7 ZD981 C7

Adapter	715G4361	3 2009-10-22

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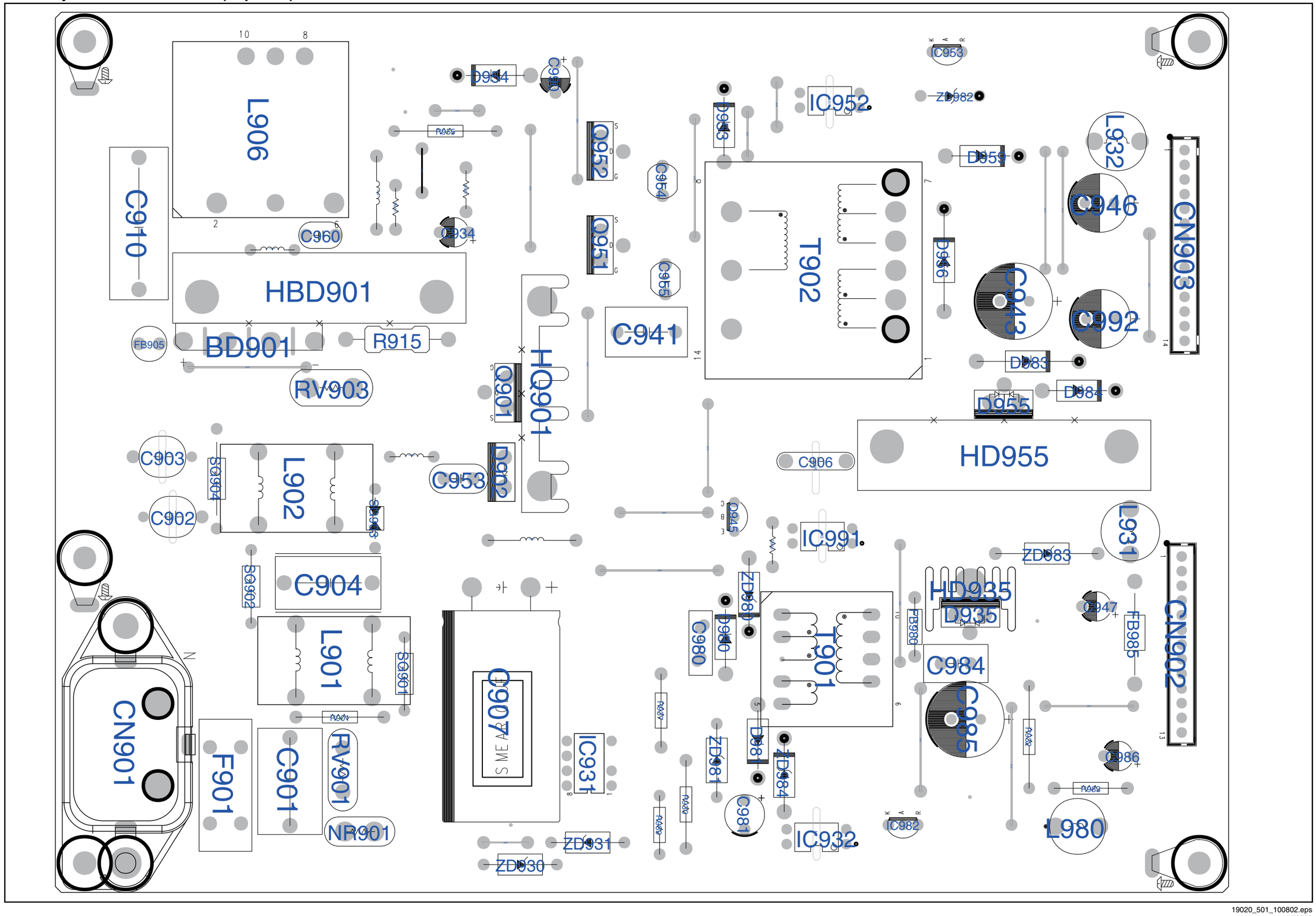
Layout Power Board 32" (Top Side)



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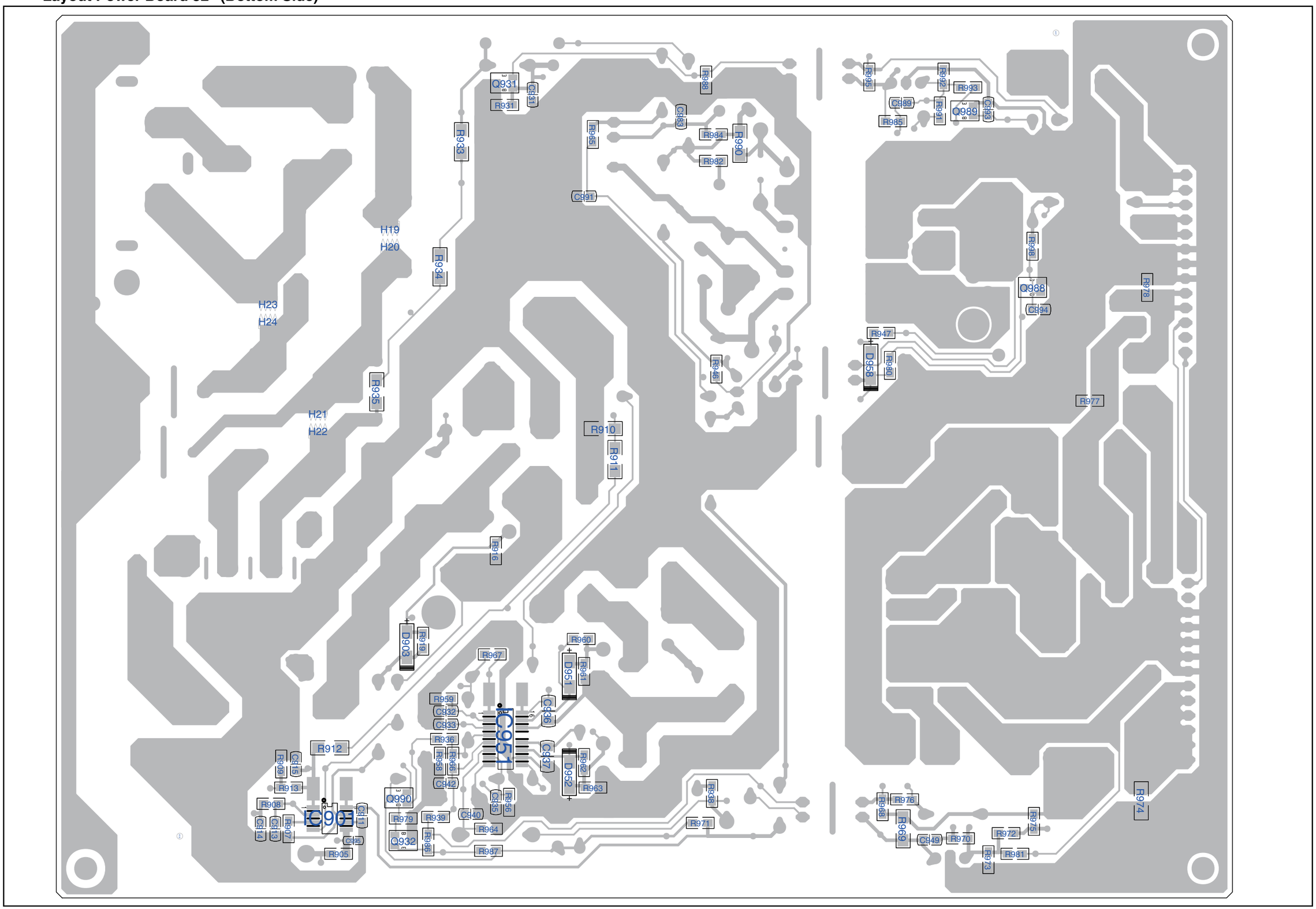
100802

Layout Power Board 32" (Bottom Side)

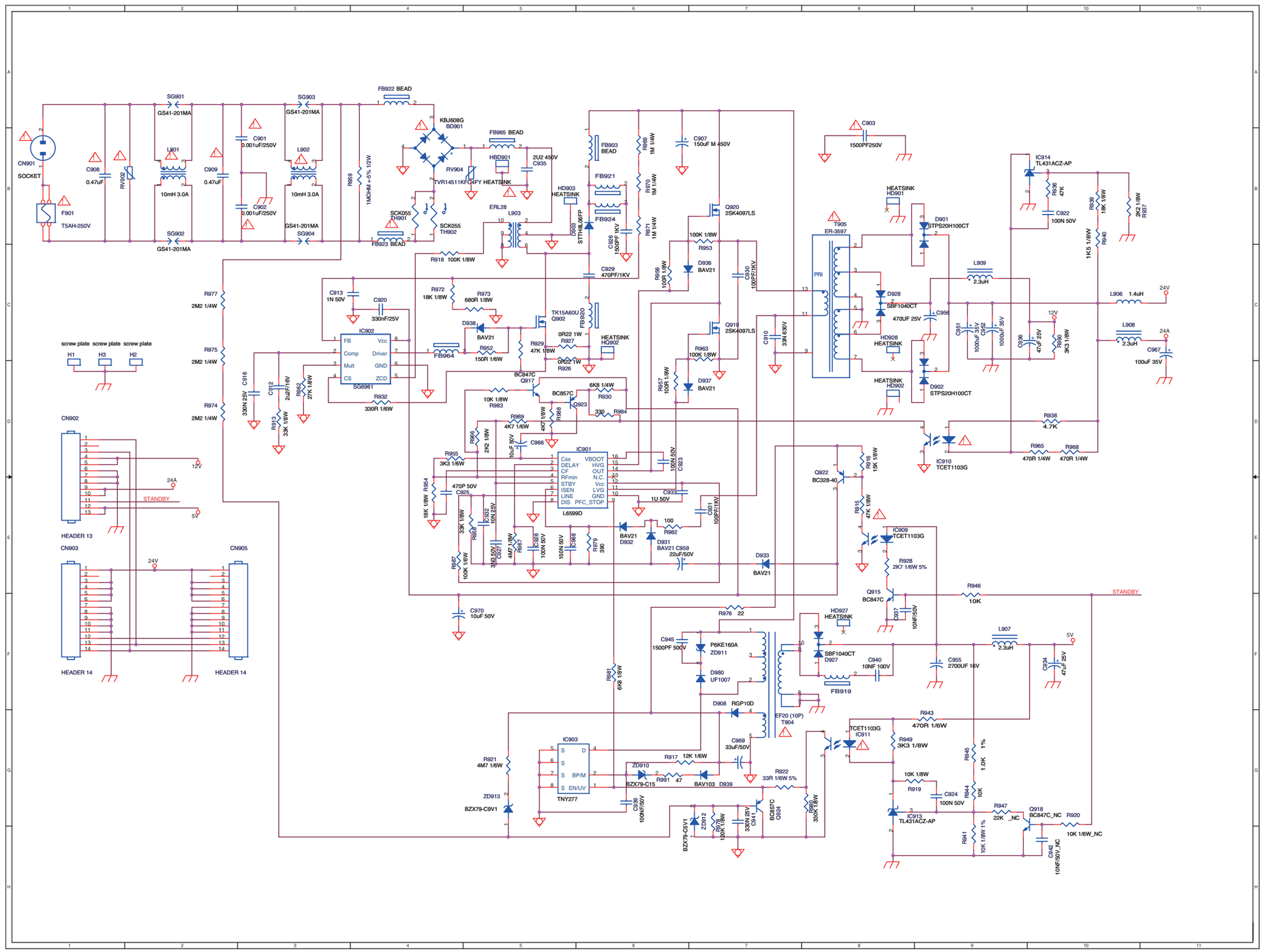


19020_502_100802.eps
100802

Power Board: 37", 42"

A01 Adapter

A01



BD901 A4 CN901 A1
CN902 D1 CN903 E1
CN905 E2 CN906 B4
C900 B8 C901 B3
C902 B3 C903 B8
C907 B6 C908 B2
C909 B3 C910 C7
C912 D3 C913 C3
C915 D3 C916 D3
C918 D4 C920 C4
C922 B10 C923 D6
C924 G9 C925 E4
C926 B6 C927 E5
C928 E5 C929 C6
C930 C7 C931 E6
C932 E5 C933 E6
C934 F10 C935 B5
C936 C9 C937 E8
C939 G6 C940 F8
C941 G7 C942 H9
C945 F6 C951 C9
C952 C9 C955 F9
C956 C9 C959 E6
C966 D5 C967 C11
C968 E5 C969 G7
C970 F4 D901 B8
D902 C8 D903 B6
D908 F7 D924 F6
D927 F8 D928 C8
D930 D4 D931 E6
D932 E6 D933 E7
D936 C6 D937 D6
D938 C5 D940 C5
FB903 B5 FB904 B6
FB919 F8 FB920 C6
FB921 B6 FB922 A4
FB923 B4 FB964 C4
F901 B1 HBD901 A4
HD901 B8 HD902 D8
HD903 B5 HD927 F8
HD928 C8 HQ902 C6
HQ919 C6 IC901 D5
IC902 C3 IC903 G5
IC909 E8 IC910 D9
IC911 G8 IC913 G8
IC914 B9 L901 B2
L902 B3 L903 B5
L906 C10 L907 F9
L908 C10 L909 C9
Q1 C1 Q2 C1
Q902 C5 Q915 E8
Q916 D3 Q917 D5
Q918 G9 Q919 C7
Q920 B7 Q922 D8
Q923 D5 Q924 G7
RV902 B2 RV903 B7
RV904 B4 RV905 C1
R913 D3 R915 E8
R916 D8 R917 G6
R918 C4 R919 G8
R920 G10 R921 G5
R924 C5 R926 C5
R928 E8 R929 C5
R930 D6 R932 D4
R936 B10 R937 B10
R938 D10 R939 B10
R940 B10 R941 G9
R943 F8 R944 G9
R945 G9 R946 E9
R947 G9 R949 G8
R952 C5 R953 C6
R954 E4 R955 D4
R956 C6 R957 D6
R958 E4 R959 B4
R960 A4 R961 B4
R962 D3 R963 C6
R965 D9 R966 D5
R967 E5 R968 D10
R969 B6 R970 B6
R971 B6 R972 C4
R973 C4 R974 D2
R975 C2 R976 F7
R977 C2 R978 G7
R979 E6 R980 G7
R981 F6 R982 E6
R983 D4 R984 D6
R985 D4 R986 D3
R987 E4 R988 D5
R989 D5 R990 C10
R991 G6 R992 F6
SG1 A2 SG2 B2
SG3 A3 SG4 B3
SG5 C1 TH901 B4
T904 F7 T905 B8
ZD910 G6 ZD911 F6
ZD912 G6 ZD913 G5
ZD914 C5 ZD915 B6

A01

Adapter	715G4360	A 2010-04-02

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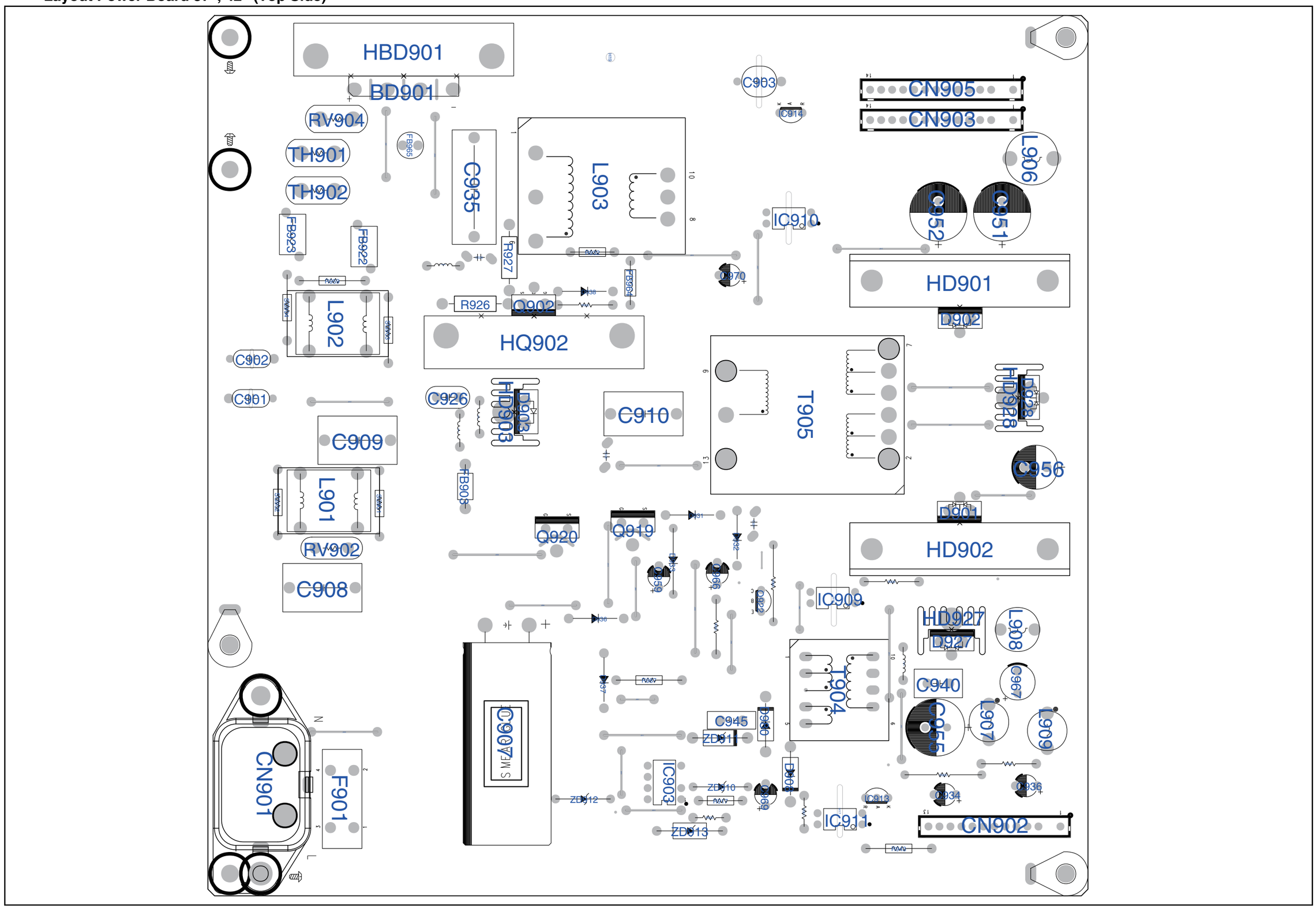
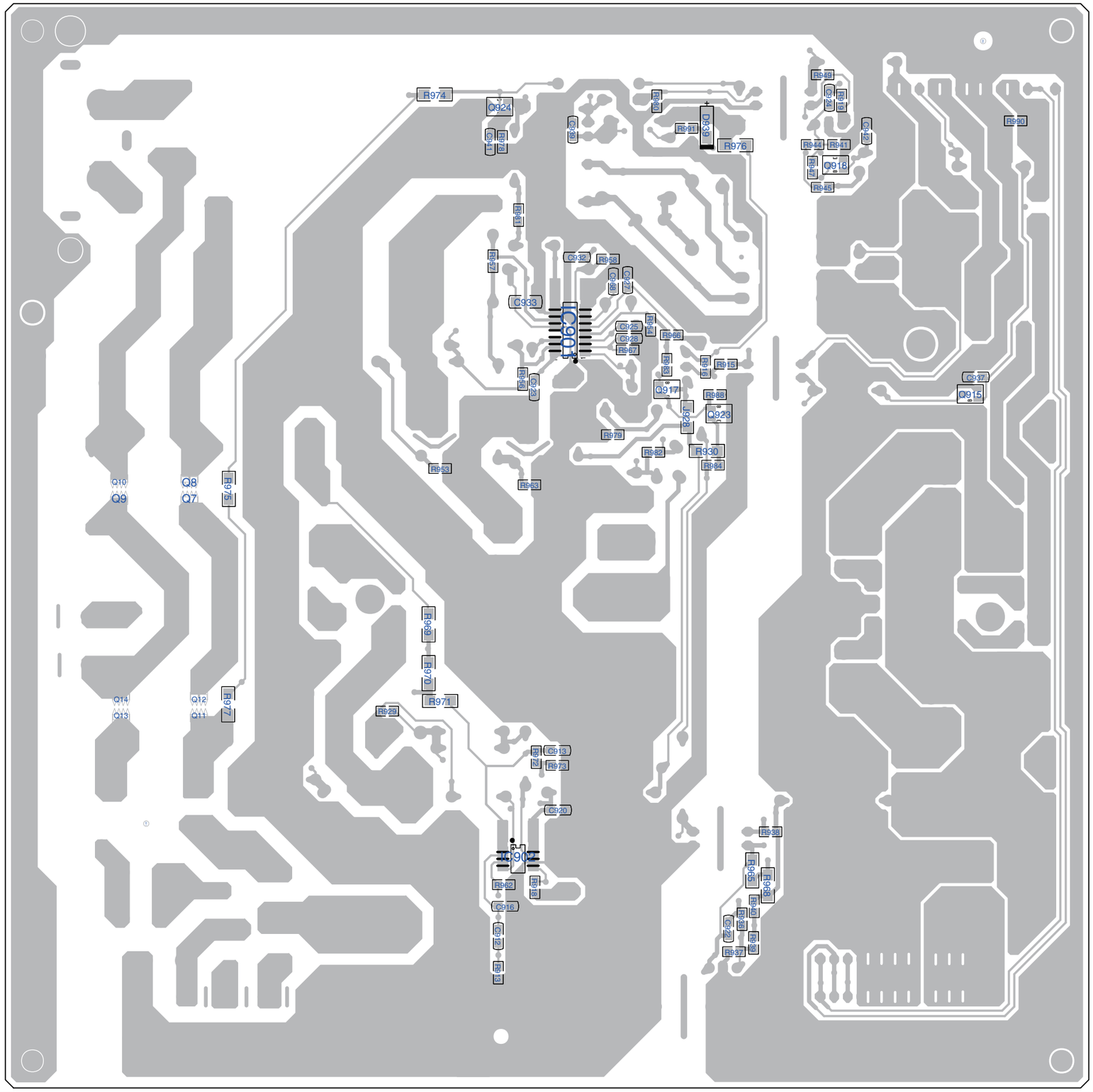
100802

Layout Power Board 37", 42" (Top Side)



19020_504_100802.eps
100802

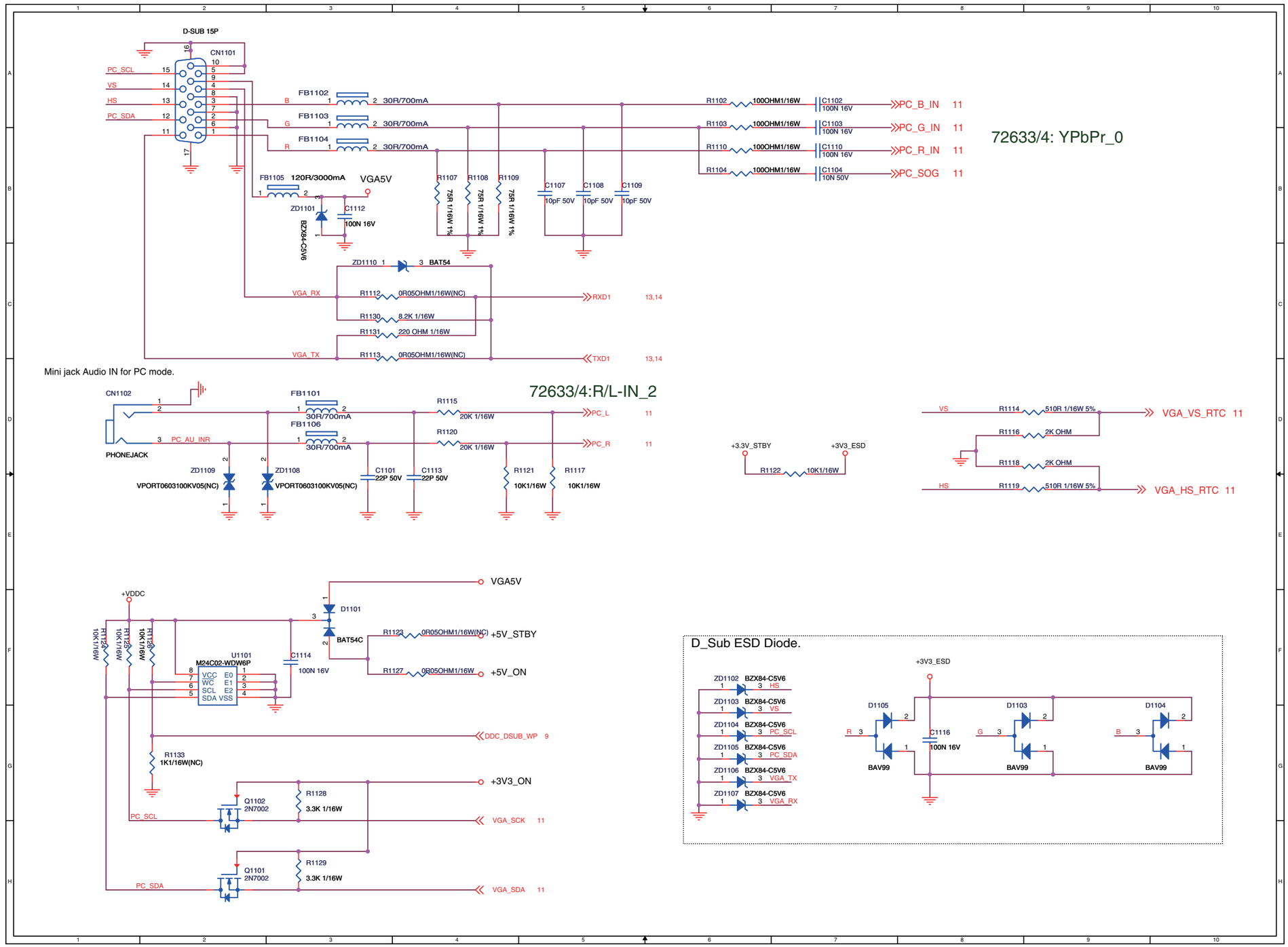
Layout Power Board 37", 42" (Bottom Side)



19020_505_100802.eps
100802

SSB: D-sub input

B01 D-SUB INPUT **B01**



CN1101 A2 CN1102 D1
C1101 D3 C1102 A7
C1103 A7 C1104 B7
C1107 B5 C1108 B5
C1109 B5 C1110 B7
C1112 B3 C1113 D4
C1114 F3 C1116 G8
D1101 F3 D1103 F8
D1104 F10 D1105 F7
FB1101 D3 FB1102 A3
FB1103 A3 FB1104 B3
FB1105 B3 FB1106 D3
Q1101 H2 Q1102 G2
R1102 A6 R1103 A6
R1104 B6 R1107 B4
R1108 B4 R1109 B4
R1110 B6 R1112 C3
R1113 C3 R1114 D9
R1115 D4 R1116 D9
R1117 D5 R1118 D9
R1119 E9 R1120 D4
R1121 D4 R1122 D7
R1123 F4 R1124 F1
R1125 F1 R1126 F2
R1127 F4 R1128 G3
R1129 H3 R1130 C3
R1131 C3 R1133 G2
U1101 F2 ZD1101 B3
ZD1102 F6 ZD1103 F6
ZD1104 G6 ZD1105 G6
ZD1106 G6 ZD1107 G6
ZD1108 D2 ZD1109 D2

D-SUB INPUT	715G3891	A 2010-04-02

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SSB: Rear I/O

B02 REAR I/O **B02**

CVI 1 IN

Video_IN

CN1202A
JACK(NC)
PR1 FB1203 30R/700mA(NC)
Y1 FB1202 30R/700mA(NC)
PB1 FB1201 30R/700mA(NC)
R1206 75R 1/16W 1%(NC)
C1207 R1207 75R 1/16W 1%(NC) 10P 50V(NC)
C1202 R1208 75R 1/16W 1%(NC) 10P 50V(NC)
C1208 10P 50V(NC)

R1219 100OHM1/16W C1219 100N 16V >>COMP1_PR1+ 11
R1218 100OHM1/16W C1218 100N 16V >>COMP1_PR1- 11
R1216 100OHM1/16W C1216 10N 50V >>COMP1_SOG1 11
R1217 100OHM1/16W C1217 100N 16V >>COMP1_Y1+ 11
R1220 100OHM1/16W C1220 100N 16V >>COMP1_Y1- 11
R1222 100OHM1/16W C1222 100N 16V >>COMP1_PB1+ 11
R1221 100OHM1/16W C1221 100N 16V >>COMP1_PB1- 11

Audio_IN

CN1202B
JACK(NC)
YPbPr1_AU_INL
YPbPr1_AU_INR
R1209 20K 1/16W(NC)
R1211 20K 1/16W(NC)
AUL0 >>YPBPR1_L 11
AUR0 >>YPBPR1_R 11
ZD1203 VPORT0603100KV05(NC)
ZD1204 VPORT0603100KV05(NC)
C1209 22P 50V(NC)
C1210 22P 50V(NC)
R1210 10K1/16W(NC)
R1212 10K1/16W(NC)

72633/4: R/L-IN_1

AV-1 IN

AV-1

CN1201
JACK
EAVC
L1201 1.8uH
C1212 220pF 50V
C1213 220pF 50V
R1214 75R 1/16W 1%
AV_CVBS1 >>AV_CVBS1 5
AV1_L_IN 5
AV1_R_IN 5
ZD1202 VPORT0603100KV05
ZD1201 VPORT0603100KV05
C1201 22P 50V
C1214 22P 50V

+3V3_ESD
D1203 BAV99(NC)
D1204 BAV99(NC)
D1205 BAV99(NC)
D1202 BAV99
PR1
Y1
PB1
EAVC
C1215 100N 16V

REAR I/O	715G3891	A 2010-04-02

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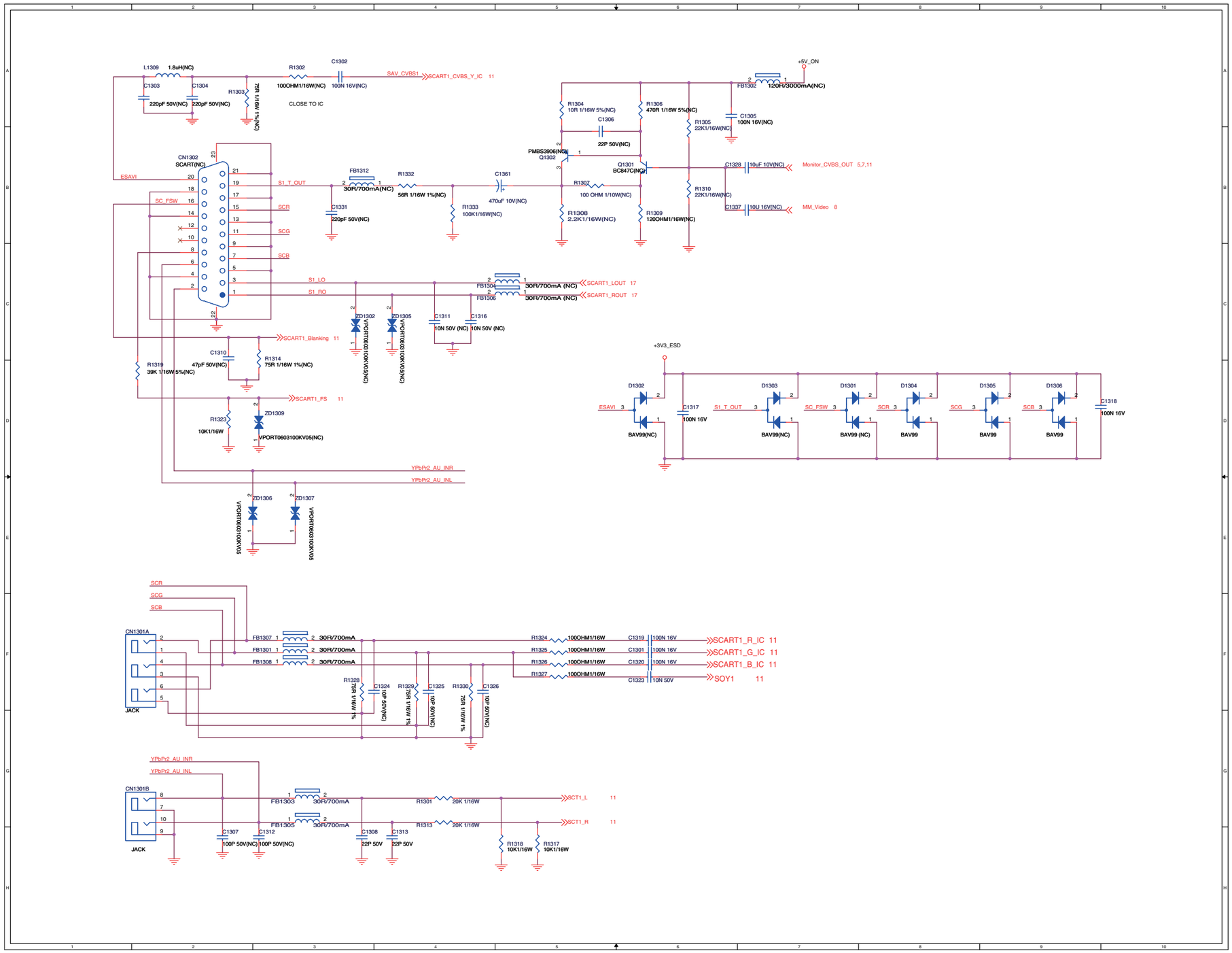
SSB: Scart

B03 SCART

B03



B03

N1301A F1 N1301B G1
CN1302 B2 C1301 F6
C1302 A3 C1303 A2
C1304 A2 C1305 A6
C1306 A5 C1307 G2
C1308 G3 C1310 C2
C1311 C4 C1312 G2
C1313 G4 C1316 C4
C1317 D6 C1318 D9
C1319 F6 C1320 F6
C1323 F6 C1324 F3
C1325 F4 C1326 F4
C1328 B6 C1331 B3
C1337 B6 C1361 B4
D1301 D7 D1302 D6
D1303 D7 D1304 D8
D1305 D8 D1306 D9
FB1301 F3 FB1302 A7
FB1303 G3 FB1304 C4
FB1305 G3 FB1306 C4
FB1307 F3 FB1308 F3
FB1312 B3 L1309 A2
Q1301 B6 Q1302 B5
R1301 G4 R1302 A3
R1303 A2 R1304 A5
R1305 A6 R1306 A6
R1307 B5 R1308 B5
R1309 B6 R1310 B6
R1313 G4 R1314 C2
R1317 G5 R1318 G4
R1319 C1 R1323 D2
R1324 F5 R1325 F5
R1326 F5 R1327 F5
R1328 F3 R1329 F4
R1330 F4 R1332 B4
R1333 B4 ZD1302 C3
ZD1305 C4 ZD1306 E2
ZD1307 E3 ZD1309 D2

SCART	715G3891	A 2010-04-02

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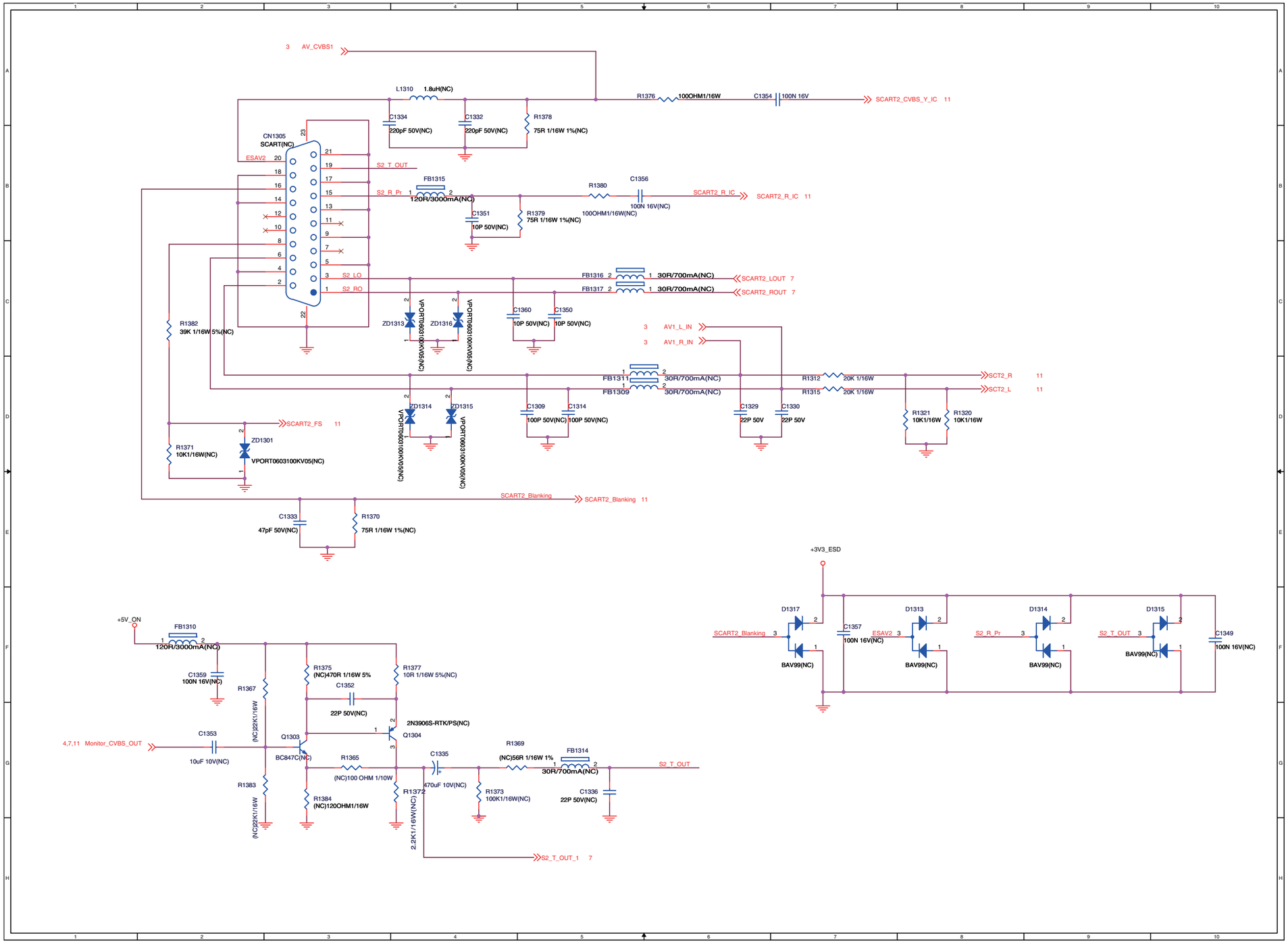
SSB: Scart 2

B04 SCART 2

B04



CN1305 B3 C1309 D4
C1314 D5 C1329 D6
C1330 D6 C1332 A4
C1333 E3 C1334 A3
C1335 G4 C1336 G5
C1349 F10 C1350 C5
C1351 B4 C1352 F3
C1353 G2 C1354 A6
C1356 B5 C1357 F7
C1359 F2 C1360 C4
D1313 F7 D1314 F8
D1315 F9 D1317 F7
FB1309 D5 FB1310 F2
FB1311 D5 FB1314 G5
FB1315 B4 FB1316 C5
FB1317 C5 L1310 A4
Q1303 G3 Q1304 G3
R1312 D7 R1315 D7
R1320 D8 R1321 D7
R1365 G3 R1367 F2
R1369 G4 R1370 E3
R1371 D2 R1372 G3
R1373 G4 R1375 F3
R1376 A6 R1377 F3
R1378 A4 R1379 B4
R1380 B5 R1382 C2
R1383 G2 R1384 G3
ZD1301 D2 ZD1313 C4
ZD1314 D4 ZD1315 D4

SCART 2	715G3891	A 2010-04-02

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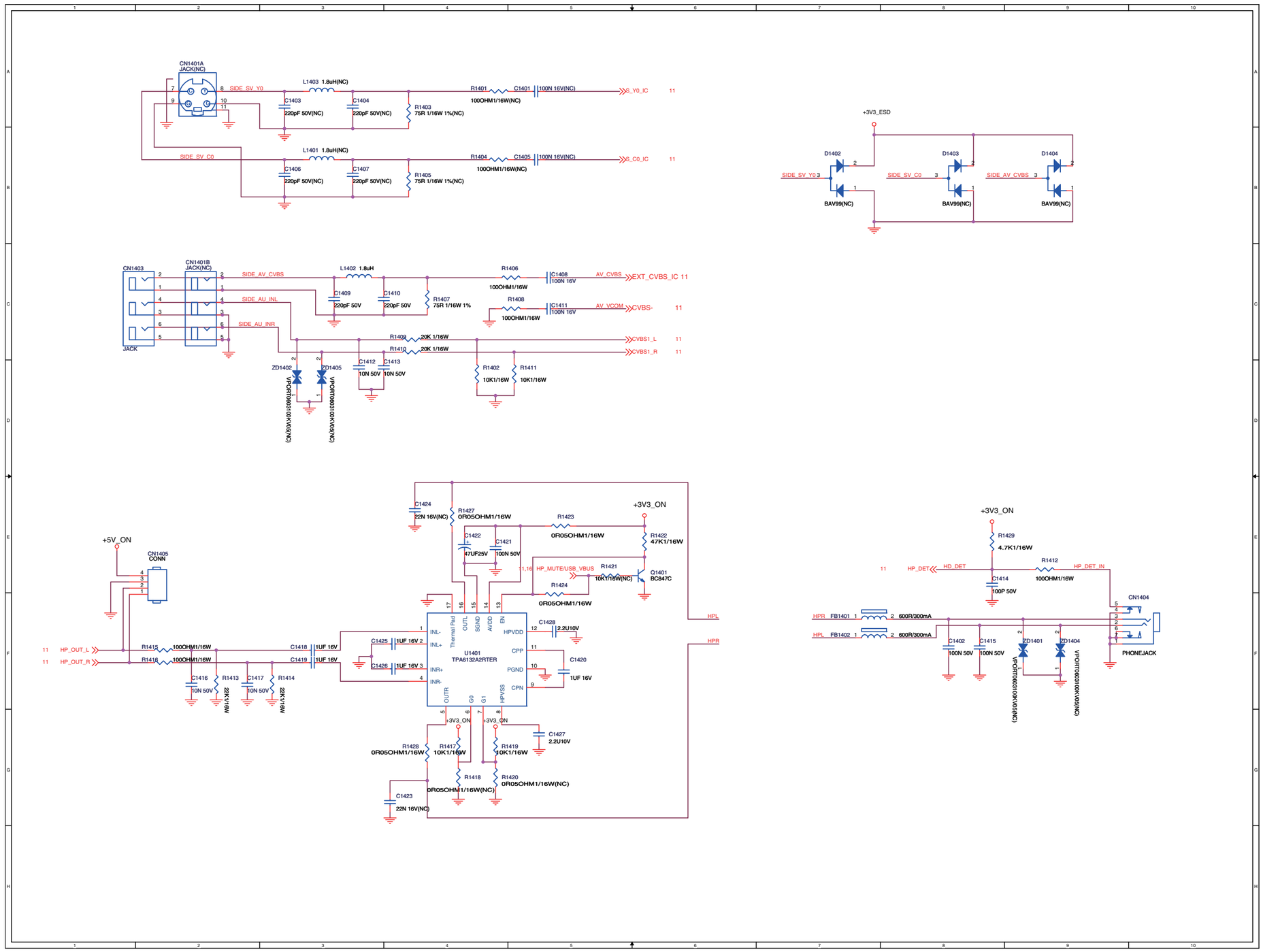
100811

SSB: Side input

B05 SIDE INPUT

B05



N1401A A2 N1401B C2
CN1403 C1 CN1404 F9
CN1405 E2 C1401 A5
C1402 F8 C1403 A3
C1404 A3 C1405 B5
C1406 B3 C1407 B3
C1408 C5 C1409 C3
C1410 C3 C1411 C5
C1412 D3 C1413 D3
C1414 E8 C1415 F8
C1416 F2 C1417 F2
C1418 F3 C1419 F3
C1420 F5 C1421 E4
C1422 E4 C1423 G3
C1424 E4 C1425 F4
C1426 F4 C1427 G5
C1428 F5 D1402 B7
D1403 B8 D1404 B9
FB1401 F7 FB1402 F7
L1401 B3 L1402 C3
L1403 A3 Q1401 E5
R1401 A4 R1402 D4
R1403 A4 R1404 B4
R1405 B4 R1406 C4
R1407 C4 R1408 C4
R1409 C4 R1410 C4
R1411 D4 R1412 E9
R1413 F2 R1414 F3
R1415 F2 R1416 F2
R1417 G4 R1418 G4
R1419 G4 R1420 G4
R1421 E5 R1422 E6
R1423 E5 R1424 E5
R1427 E4 R1428 G4
R1429 E8 U1401 F4
ZD1401 F9 ZD1402 D3
ZD1404 F9 ZD1405 D3

SIDE INPUT	715G3891	A 2010-04-02

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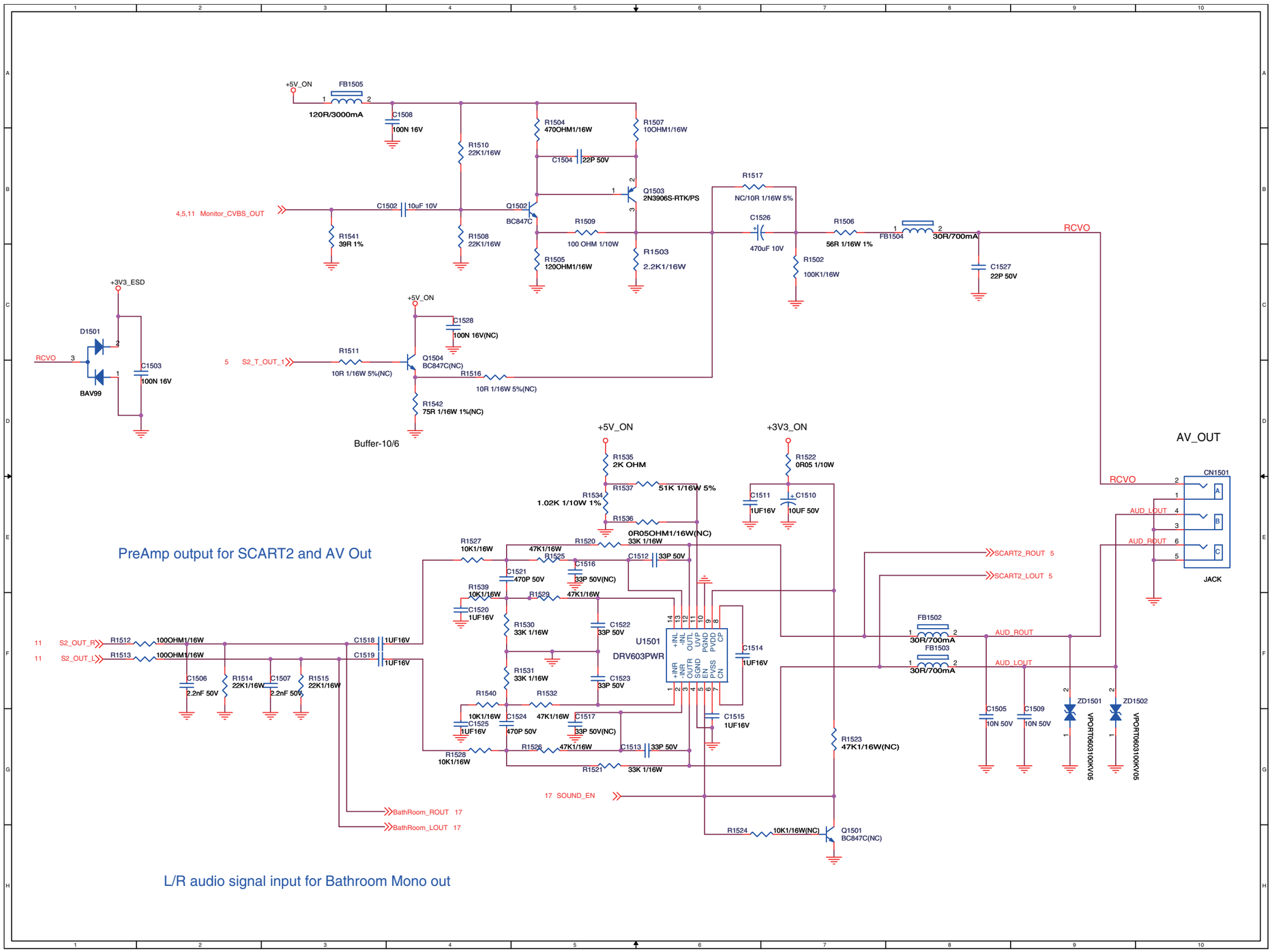
100809

SSB: CVBS audio out

B06 CVBS AUDIO OUT

B06



CN1501 D10 C1502 B4
C1503 D1 C1504 B5
C1505 F8 C1506 F2
C1507 F2 C1508 A3
C1509 F8 C1510 E7
C1511 E6 C1512 E6
C1513 G6 C1514 F6
C1515 F6 C1516 E5
C1517 G5 C1518 F3
C1519 F3 C1520 F4
C1521 E4 C1522 F5
C1523 F5 C1524 G4
C1525 G4 C1526 B6
C1527 C8 C1528 C4
D1501 C1 FB1502 F8
FB1503 F8 FB1504 B8
FB1505 A3 Q1501 G7
Q1502 B5 Q1503 B5
Q1504 C4 R1502 C7
R1503 C5 R1504 A5
R1505 C5 R1506 B7
R1507 A5 R1508 B4
R1509 B5 R1510 B4
R1511 C3 R1512 F1
R1513 F1 R1514 F2
R1515 F3 R1516 D4
R1517 B6 R1520 E5
R1521 G5 R1522 D7
R1523 G7 R1524 G6
R1525 E5 R1526 G5
R1527 E4 R1528 G4
R1529 E5 R1530 F4
R1531 F4 R1532 F5
R1534 E5 R1535 D5
R1536 E5 R1537 D5
R1539 E4 R1540 F4
R1541 B3 R1542 D4
U1501 F6 ZD1501 F9

CVBS AUDIO OUT	715G3891	A 2010-04-02

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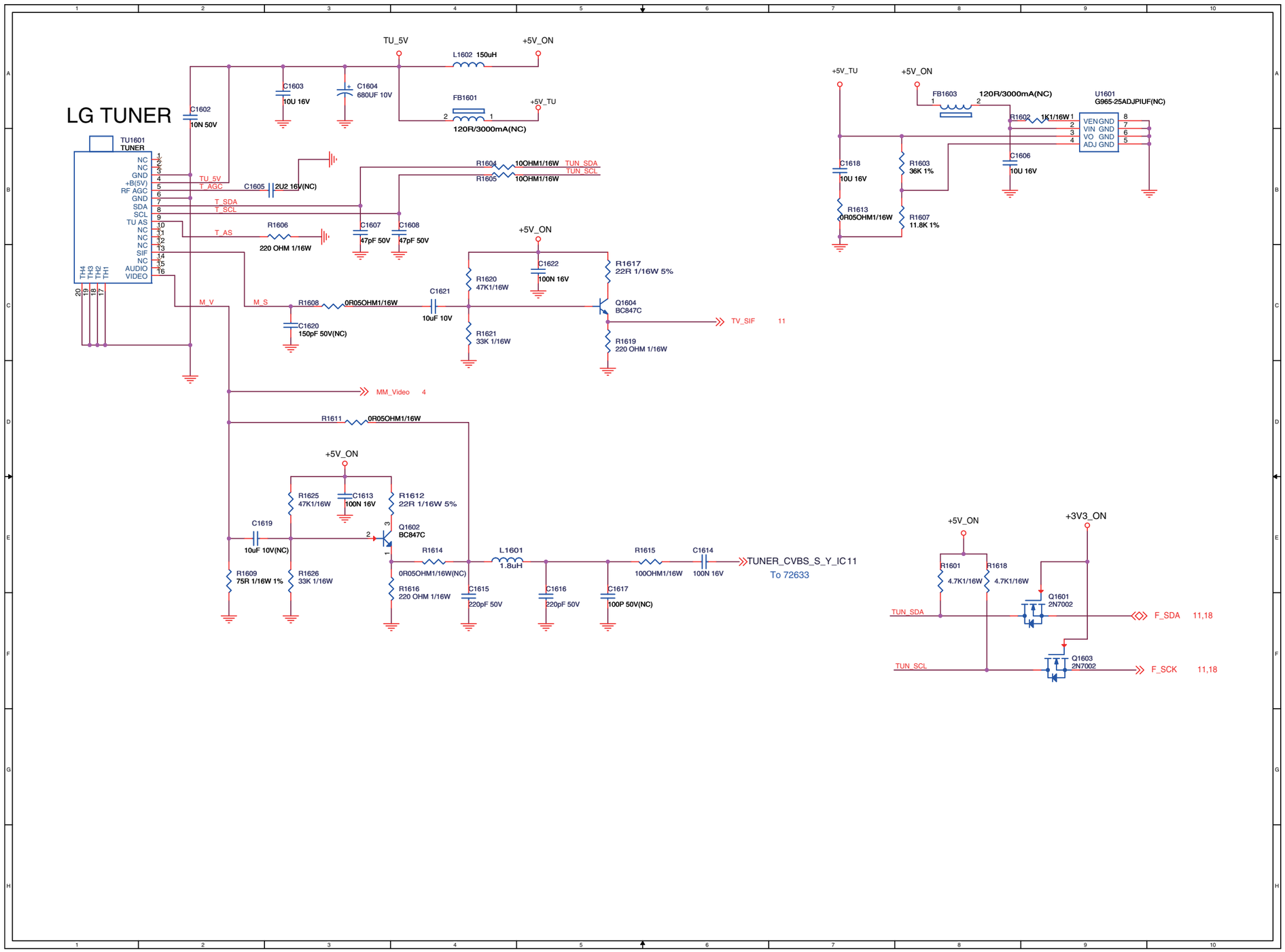
SSB: Tuner

B07 TUNER

B07



C1602 A2 C1603 A3
C1604 A3 C1605 B3
C1606 B8 C1607 B3
C1608 B3 C1613 E3
C1614 E6 C1615 E4
C1616 E5 C1617 E5
C1618 B7 C1619 E2
C1620 C3 C1621 C4
C1622 C5 FB1601 A4
FB1603 A8 L1601 E4
L1602 A4 Q1601 E8
Q1602 E3 Q1603 F9
Q1604 C5 R1601 E8
R1602 A8 R1603 B7
R1604 B4 R1605 B4
R1606 B3 R1607 B7
R1608 C3 R1609 E2
R1611 D3 R1612 E3
R1613 B7 R1614 E4
R1615 E5 R1616 E3
R1617 C5 R1618 E8
R1619 C5 R1620 C4
R1621 C4 R1625 E3
R1626 E3 TU1601 B1

TUNER	715G3891	A 2010-04-02

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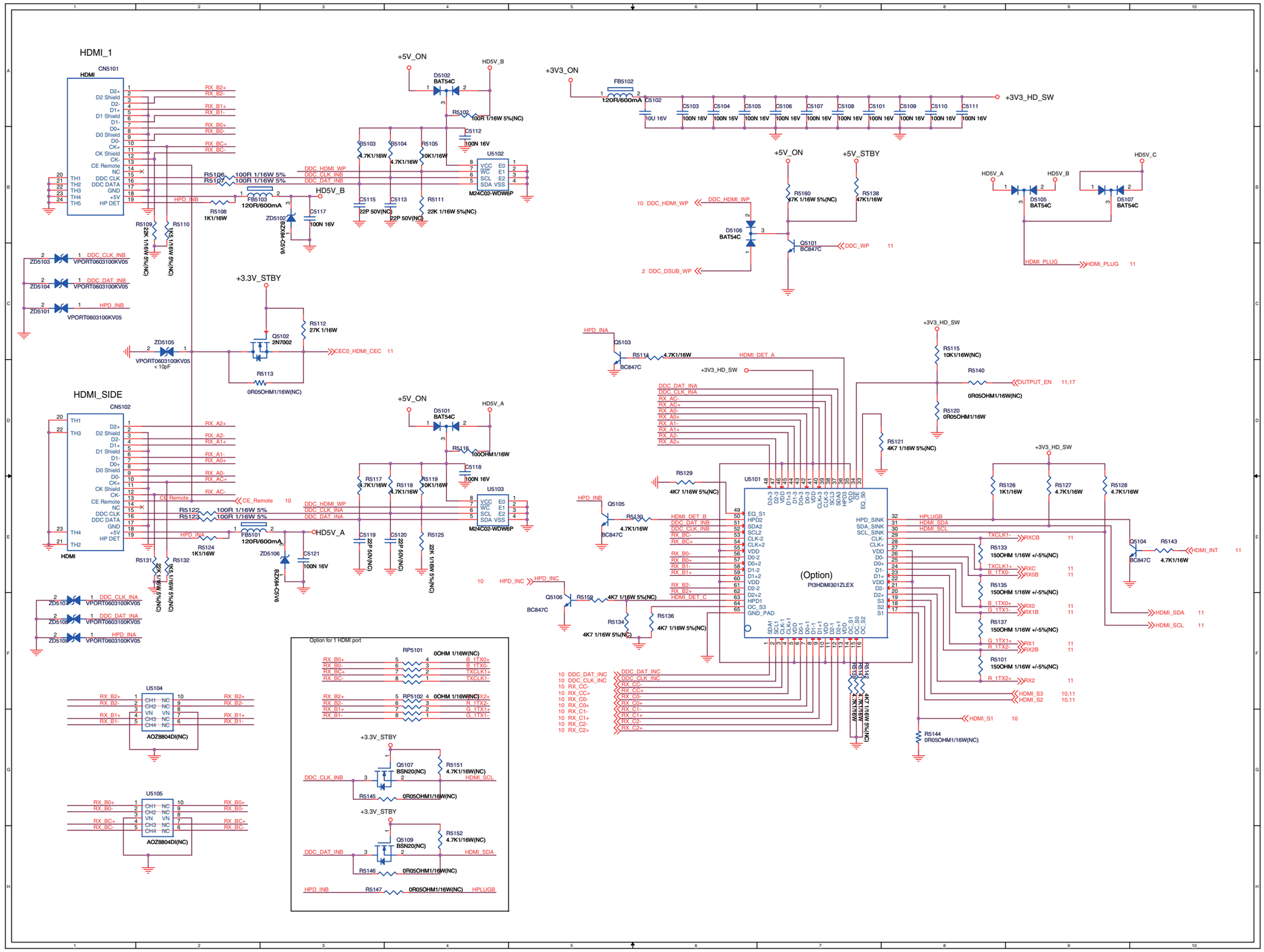
100809

SSB: HDMI input

B08 HDMI INPUT

B08



CN5101 A1 CN5102 D1
C5101 A7 C5102 A6
C5103 A6 C5104 A6
C5105 A6 C5106 A7
C5107 A7 C5108 A7
C5109 A8 C5110 A8
C5111 A8 C5112 B4
C5113 B3 C5115 B3
C5117 B3 C5118 D4
C5119 E3 C5120 E3
C5121 E3 D5101 D4
D5102 A4 D5105 B8
D5106 B6 D5107 B9
FB5101 E2 FB5102 A5
FB5103 B2 Q5101 B7
Q5102 C2 Q5103 C5
Q5104 E9 Q5105 E5
Q5106 E5 Q5107 G3
Q5109 H3 RP5101 F4
RP5102 F4 R5101 F8
R5102 A4 R5103 B3
R5104 B3 R5105 B4
R5106 B2 R5107 B2
R5108 B2 R5109 B2
R5110 B2 R5111 B4
R5112 C3 R5113 D2
R5114 C6 R5115 C8
R5116 D4 R5117 D3
R5118 D3 R5119 D4
R5120 D8 R5121 D7
R5122 E2 R5123 E2
R5124 E2 R5125 E4
R5126 D8 R5127 D9
R5128 D9 R5129 D6
R5130 E5 R5131 E2
R5132 E2 R5133 E8
R5134 F5 R5135 E8
R5136 F6 R5137 F8
R5138 B7 R5139 F7
R5140 D8 R5141 F7
R5142 F7 R5143 E10
R5144 G8 R5145 G3
R5146 H3 R5147 H3
R5151 G4 R5152 G4
R5159 E5 R5160 B7
U5101 E6 U5102 B4
U5103 E4 U5104 F2
U5105 G2 ZD5101 C1
ZD5102 B3 ZD5103 C1
ZD5104 C1 ZD5105 C2
ZD5106 E3 ZD5107 E1
ZD5108 F1 ZD5109 F1

HDMI INPUT	715G3891	A 2010-04-02

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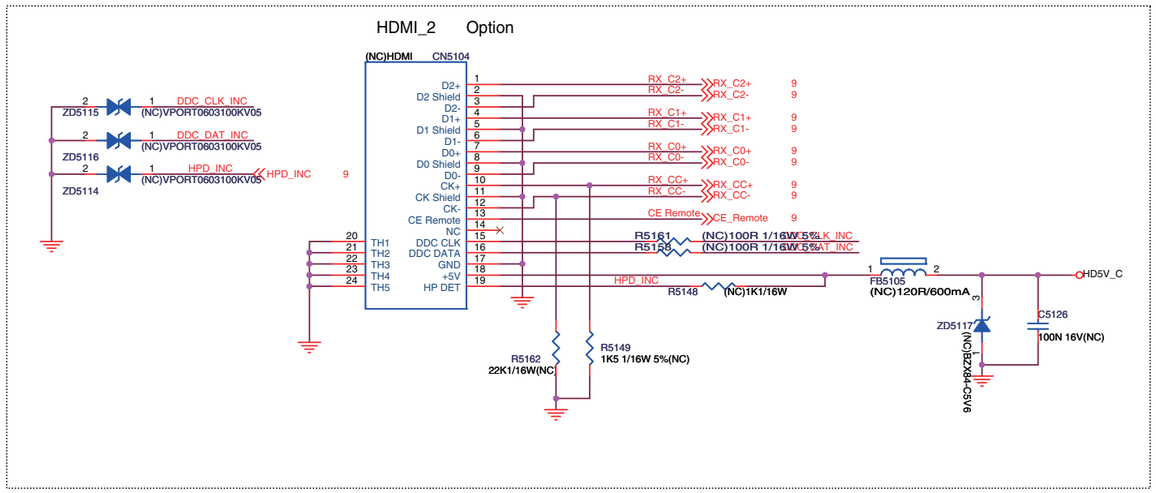
100802

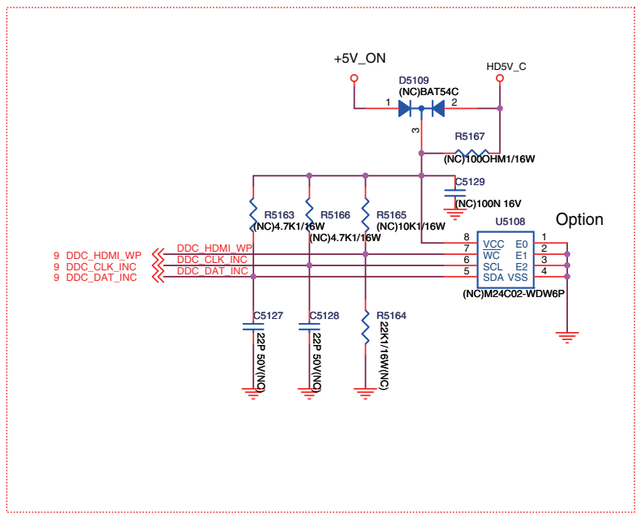
SSB: HDMI input 3

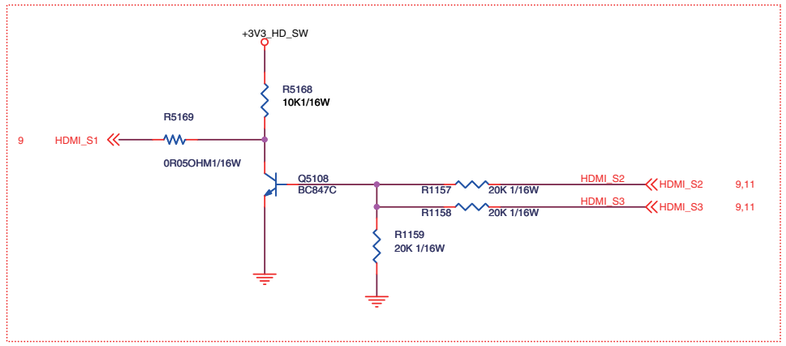
B09 HDMI INPUT 3

B09

CN5104 A2 C5126 B3
C5127 C1 C5128 C1
C5129 C2 D5109 B2
FB5105 A3 Q5108 C4
R1157 C4 R1158 C4
R1159 C4 R5148 A3
R5149 B2 R5158 A2
R5161 A2 R5162 B2
R5163 C1 R5164 C2
R5165 C2 R5166 C1
R5167 C2 R5168 C4
R5169 C3 U5108 C2
ZD5114 A1 ZD5115 A1
ZD5116 A1 ZD5117 A3







HDMI INPUT 3	715G3891	A 2010-04-02

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100802

SSB: Scaler NT7263X

B10 SCALAR NT7263X

B10

NT72634FG/A

C4101 A4 C4102 A3
C4103 A4 C4104 A2
C4105 A3 C4106 A4
C4107 A3 C4108 A4
C4109 A4 C4110 A4
C4111 A4 C4112 A4
C4113 A5 C4114 A5
C4115 A5 C4116 A5
C4117 A5 C4118 A5
C4119 A5 C4120 A5
C4121 A6 C4122 A6
C4123 A6 C4124 A6
C4125 A6 C4126 A3
C4127 A3 C4128 A4
C4129 A4 C4130 A4
C4131 A6 C4132 A6
C4133 A6 C4134 A3
C4135 A4 C4136 A5
C4137 A4 C4138 A3
C4139 A1 C4140 B3
C4141 B3 C4142 C4
C4143 C4 C4144 C1
C4145 C2 C4146 C2
C4147 C1 C4148 C2
C4149 C2 C4150 C2
C4151 C2 C4152 C3
C4153 C3 C4154 C2
C4155 C2 C4156 C2
C4157 C2 C4158 C1
C4159 C1 C4160 C1
C4161 C1 C4162 C1
C4163 C1 C4164 G3
C4165 D1 C4166 D1
C4167 E6 C4168 E6
C4169 E7 C4170 E7
C4171 F7 C4172 F8
C4173 F6 C4174 F9
C4175 H5 C4176 C1
C4177 D1 C4178 D1
C4179 D1 C4180 H2
C4181 E1 C4182 E1
C4183 D1 C4184 D1
C4185 F1 C4186 F1
C4187 G3 D4101 F6
FB4102 A2 FB4103 A2
FB4104 A2 FB4105 A2
FB4106 A2 FB4107 A2
FB4108 A2 FB4109 A2
FB4110 G3 FB4111 G3
Q4101 G9 RP4102 A7
RP4103 A7 RP4104 C7
RP4105 A7 RP4106 A7
RP4107 B7 RP4108 B7
RP4109 B7 RP4110 B7
RP4111 B7 R4101 D1
R4102 C7 R4103 C7
R4104 B1 R4105 B2
R4106 G2 R4107 H2
R4108 G2 R4112 C7
R4113 C7 R4114 B1
R4115 B2 R4116 B4
R4117 B3 R4118 B4
R4119 C1 R4120 C1
R4121 C1 R4122 C1
R4123 C1 R4125 C1
R4126 C1 R4127 C1
R4135 D1 R4137 D1
R4140 D5 R4142 D1
R4145 D5 R4147 D5
R4149 E5 R4150 E5
R4152 F6 R4153 F8
R4154 F6 R4155 G6
R4156 G9 R4157 F9
R4158 F9 R4159 G6
R4160 G6 R4161 G7
R4163 G4 R4164 G4
R4165 H6 R4166 H6
R4167 H5 R4168 H8
R4169 H6 R4170 H6
R4171 H7 R4172 H5
R4173 C5 R4174 C5
R4175 C5 R4176 C6
R4177 C1 R4178 C1
R4179 H1 R4180 H1
R4181 H1 R4182 G9
R4183 F9 R4188 E1
R4189 E1 R4190 F1
R4191 F1 TP4101 B9
TP4102 B9 U4101 C2
U4102 G9 U4103 G1

SCALAR NT7263X	715G3891	A 2010-04-02

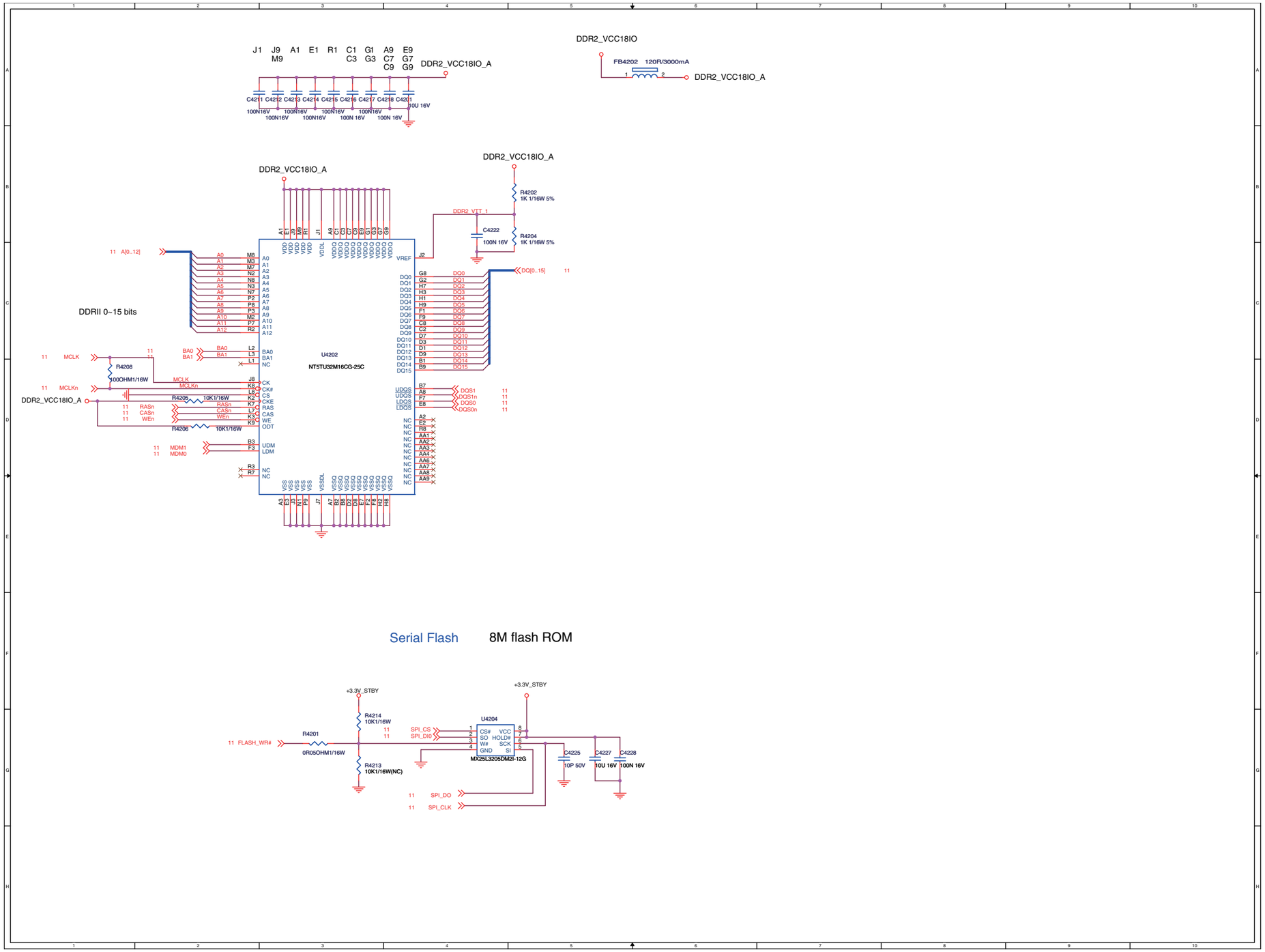
19020_515_100802.eps
100811

SSB: DDR memory

B11 DDR MEMORY

B11

C4201 A4 C4211 A2
C4212 A3 C4213 A3
C4214 A3 C4215 A3
C4216 A3 C4217 A3
C4218 A3 C4222 B4
C4225 G5 C4227 G5
C4228 G5 FB4202 A5
R4201 G3 R4202 B4
R4204 B4 R4205 D2
R4206 D2 R4208 D1
R4213 G3 R4214 F3
U4202 B2 U4204 G4



DDR MEMORY	715G3891	A 2010-04-02

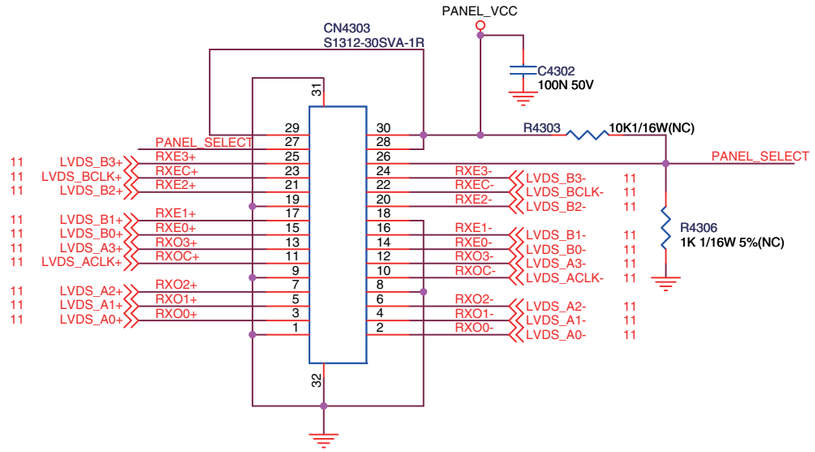
19020_516_100802.eps
100809

SSB: Panel I/F ICE/UART

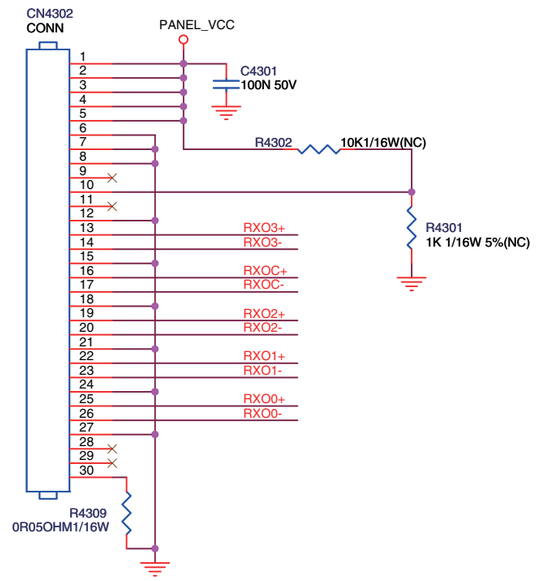
B12 PANEL I/F ICE/UART B12

CN4302 B5 CN4303 B2
CN4304 F3 CN4305 F7
CN4306 F7 C4301 B6
C4302 B3 FB4301 F6
R4301 C7 R4302 B7
R4303 B4 R4304 G3
R4305 G3 R4306 C4
R4307 F6 R4308 F6
R4309 D6 R4310 G6

26"~42"

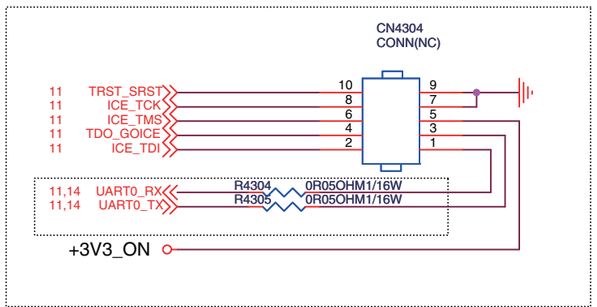


19"~22"

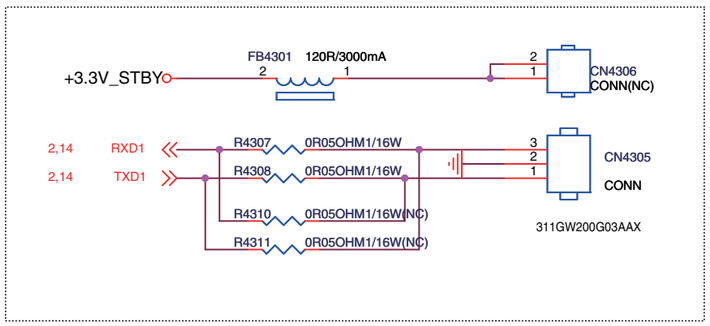


	22"	32"~42"
CN4302	YES	NC
CN4303	NC	YES

ICE FOR ARM & DSP / UART FOR ARM



UART FOR STBC



PANEL I/F ICE/UART	715G3891	A 2010-04-02

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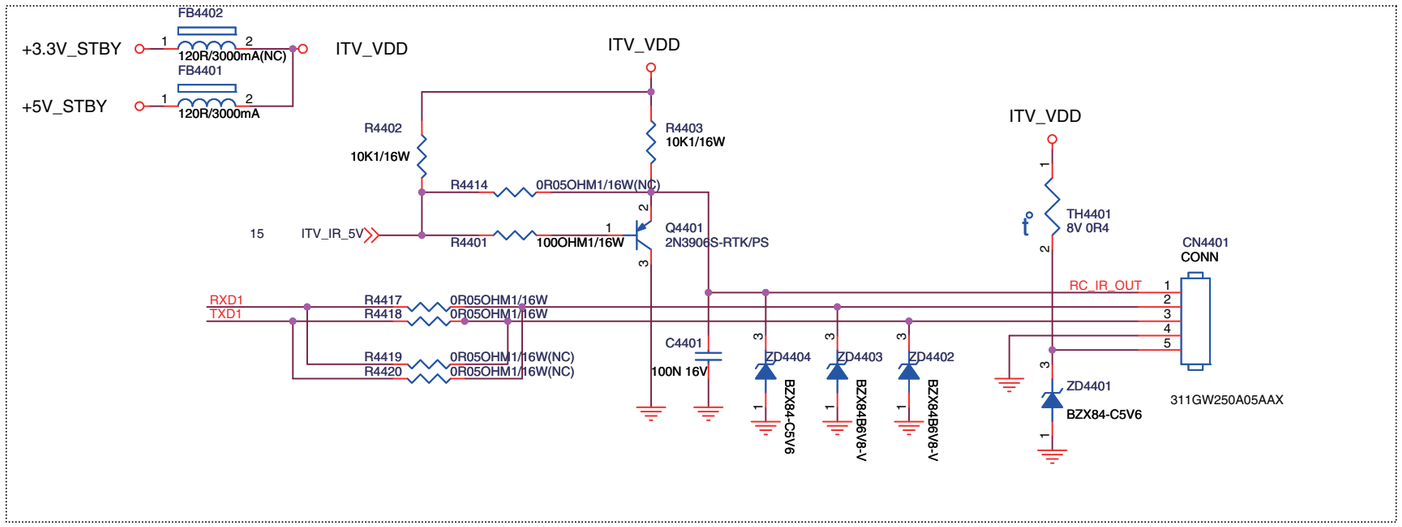
100811

SSB: iTV

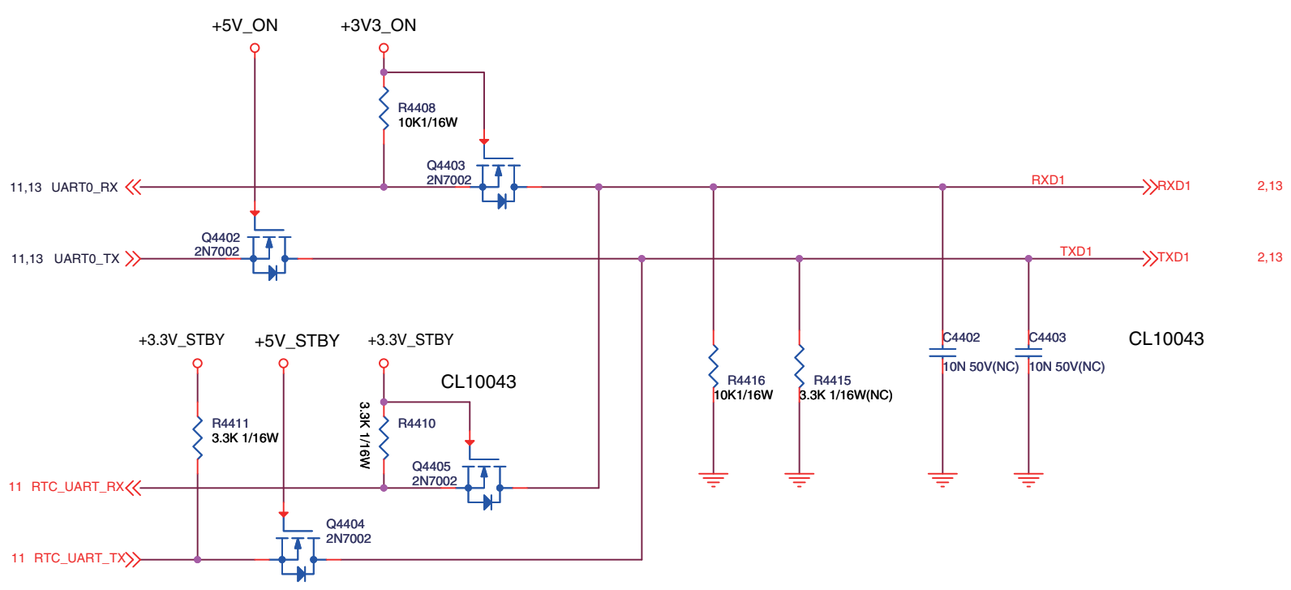
B13 ITV

B13

PORT for ITV Level 1



CN4401 C6 C4401 C4
C4402 F5 C4403 F6
FB4401 A2 FB4402 A2
Q4401 B4 Q4402 E2
Q4403 E3 Q4404 G2
Q4405 G3 R4401 B3
R4402 B3 R4403 B4
R4408 E3 R4410 G3
R4411 G2 R4414 B3
R4415 F5 R4416 F4
R4417 C3 R4418 C3
R4419 C3 R4420 C3
TH4401 B6 ZD4401 C6
ZD4402 C5 ZD4403 C5



ITV	715G3891	A 2010-04-02

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100809

SSB: Key, I/R board

B14 KEY, I/R BOARD **B14**

CN4501 D9 CN4503 A7
C4501 C6 C4502 E4
C4503 F5 C4504 F6
C4505 C7 C4506 C7
FB4501 F5 FB4502 C3
FB4503 B5 Q4501 C5
R4503 E4 R4504 F5
R4505 E5 R4506 B4
R4508 C5 R4509 D5
R4510 E6 R4511 E6
R4512 C6 R4514 D6
R4515 D6 R4516 D5
ZD4502 E4 ZD4503 A5

IR LINK

ZD4503
PESD1CAN

PHONEJACK
CN4503

IR/KeyPad BOARD

11 IR_LED_R
11 IR_LED_G
14 ITV_IR_5V
+3.3V_STBY
11 RTC_IR
+5V_STBY
11 KEYPAD_DET1
+5V_STBY
11 Light_Sensor

R4506 100OHM1/16W
FB4503 600R/300mA
R4512 (NC)0R05OHM1/16W
FB4502 120R/3000mA
R4508 4.7K1/16W
Q4501 2N7002
R4516 0R05OHM1/16W(NC)
C4501 33P 50V
C4505 100N 16V
C4506 100N 16V
R4514 0R05OHM1/16W
R4515 0R05OHM1/16W(NC)
R4509 10K1/16W
R4503 100OHM1/16W
R4510 0R05OHM1/16W
R4511 1K1/16W
ZD4502 BZX84-C5V6(NC)
C4502 100N 16V
R4505 100K1/16W(NC)
FB4501 120R/3000mA
C4503 100N 16V
C4504 100N 16V
R4504 100OHM1/16W

LED_OUT_R
LED_OUT_G
Light_Sensor_IN

CN4501
CONN

KEY, I/R BOARD | 715G3891 | A 2010-04-02

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SSB: USB

B15 USB **B15**

CN1701 E7 C1701 B2
C1703 D4 C1706 E2
C1707 F5 C1708 F5
C1709 F2 C1710 D7
C1711 D3 FB1701 C5
FB1702 A2 FB1703 B2
FB1704 E6 FB1705 F7
L1701 E4 R1701 C3
R1702 C3 R1703 C6
R1705 E6 R1706 D7
R1707 E4 R1708 F4
R1709 F5 R1710 F6
R1711 D7 R1712 C7
R1713 D7 TH1701 C5
TP1701 B1 U1701 C4

+5V_ON
FB1702
120R/3000mA
VUSB5V
+C1701
100UF 25V
FB1703
TP1701
120R/3000mA(NC)

+3V3_ON
VUSB5V
USB_+5V
+3V3_ON
USB_+5V
R1702
4.7K1/16W(NC)
TH1701
8V 0R4(NC)
R1703
4.7K1/16W(NC)
R1712
10K1/16W
U1701
FB1701
120R/3000mA
11 USB_PWR_EN
USB_PWR_EN
R1701
0R05OHM1/16W
IN
OUT
GND
EN
FAULT
STMPS2171STR
USB_PWR_OCP 11
C1711
100N 16V(NC)
C1703
100N 16V
R1713
20K 1/16W
R1711
0R05OHM1/16W(NC)
HP_MUTE/USB_VBUS 6,11
C1710
100N 16V
R1706
20K 1/16W
R1705
10K1/16W
USB_+5V
FB1704
120R/3000mA
CN1701
CONN
11 USB_DM
USB2_DM
R1707
0R05OHM1/16W
L1701
90R/400mA(NC)
C1706
47UF25V
C1709
100N 16V
11 USB_DP
USB2_DP
R1708
0R05OHM1/16W
R1709
15K 1/16W 5%
C1707
4P7 50V
C1708
4P7 50V
R1710
15K 1/16W 5%
U1702
FB1705
120R/3000mA
RClamp0520B.TCT

USB | 715G3891 | A 2010-04-02

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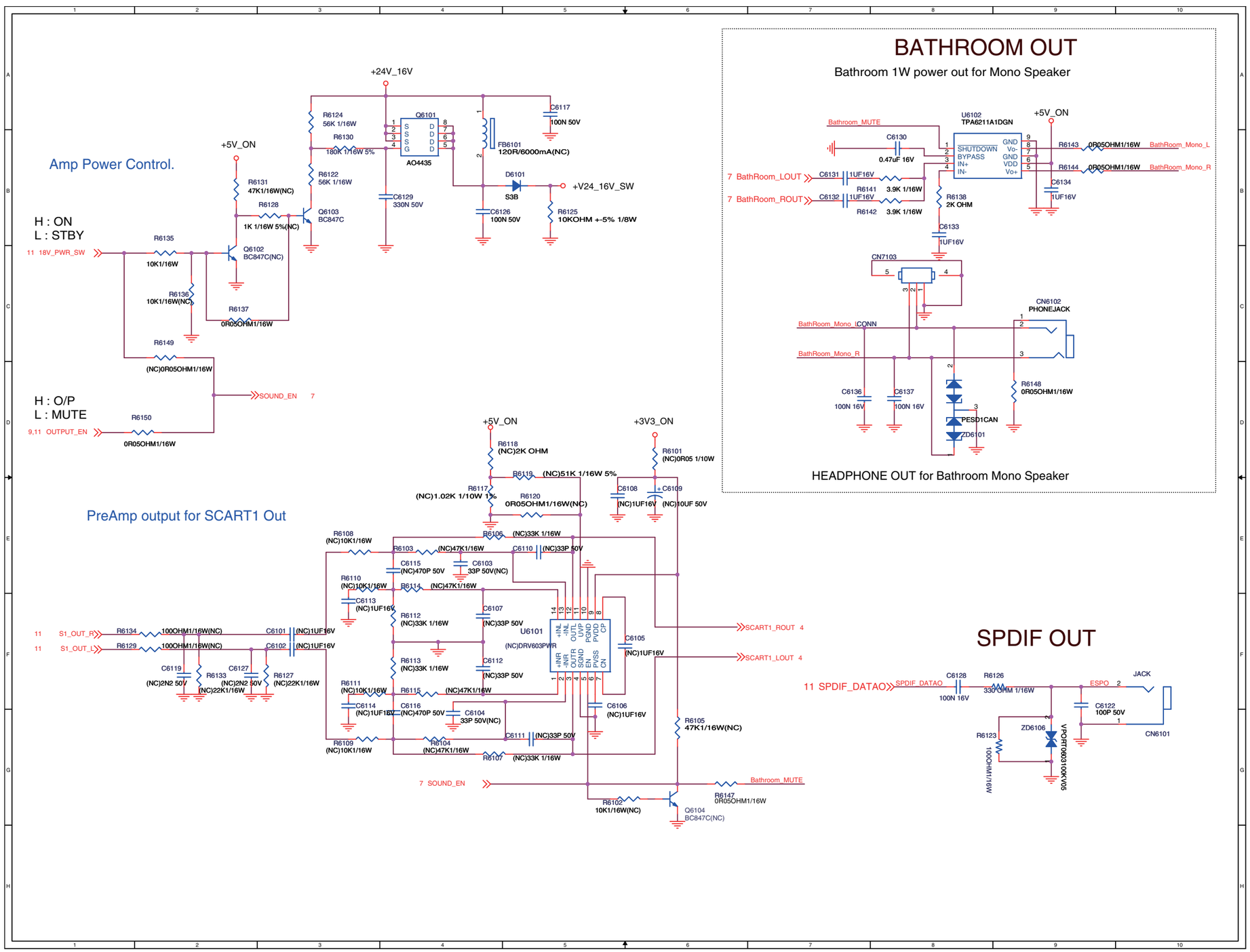
100802

SSB: Scart audio/SPdif out

B16 SCART AUDIO/SPDIF OUT

B16



CN6101 F9 CN6102 C9 CN7103 C8 C6101 F3
C6102 F3 C6103 E4 C6104 F4 C6105 F5
C6106 F5 C6107 F4 C6108 E5 C6109 E6
C6110 E5 C6111 G5 C6112 F4 C6113 E3
C6114 F3 C6115 E4 C6116 F4 C6117 A5
C6119 F2 C6122 F9 C6126 B4 C6127 F2
C6128 F8 C6129 B3 C6130 B8 C6131 B7
C6132 B7 C6133 B8 C6134 B9 C6136 D7
C6137 D8 D6101 B4 FB6101 A4 Q6101 A4
Q6102 B2 Q6103 B3 Q6104 G6 R6101 D6
R6102 G5 R6103 E4 R6104 G4 R6105 F6
R6106 E4 R6107 G4 R6108 E3 R6109 G3
R6110 E3 R6111 F3 R6112 F4 R6113 F4
R6114 E4 R6115 F4 R6117 E4 R6118 D4
R6119 D5 R6120 E5 R6122 B3 R6123 G8
R6124 A3 R6125 B5 R6126 F8 R6127 F2
R6128 B2 R6129 F2 R6130 B3 R6131 B2
R6133 F2 R6134 F2 R6135 B2 R6136 C2
R6137 C2 R6138 B8 R6141 B7 R6142 B7
R6143 B9 R6144 B9 R6147 G6 R6148 D9
R6149 C2 R6150 D1 U6101 F5 U6102 B8

SCART AUDIO/SPDIF OUT	715G3891	A 2010-04-02

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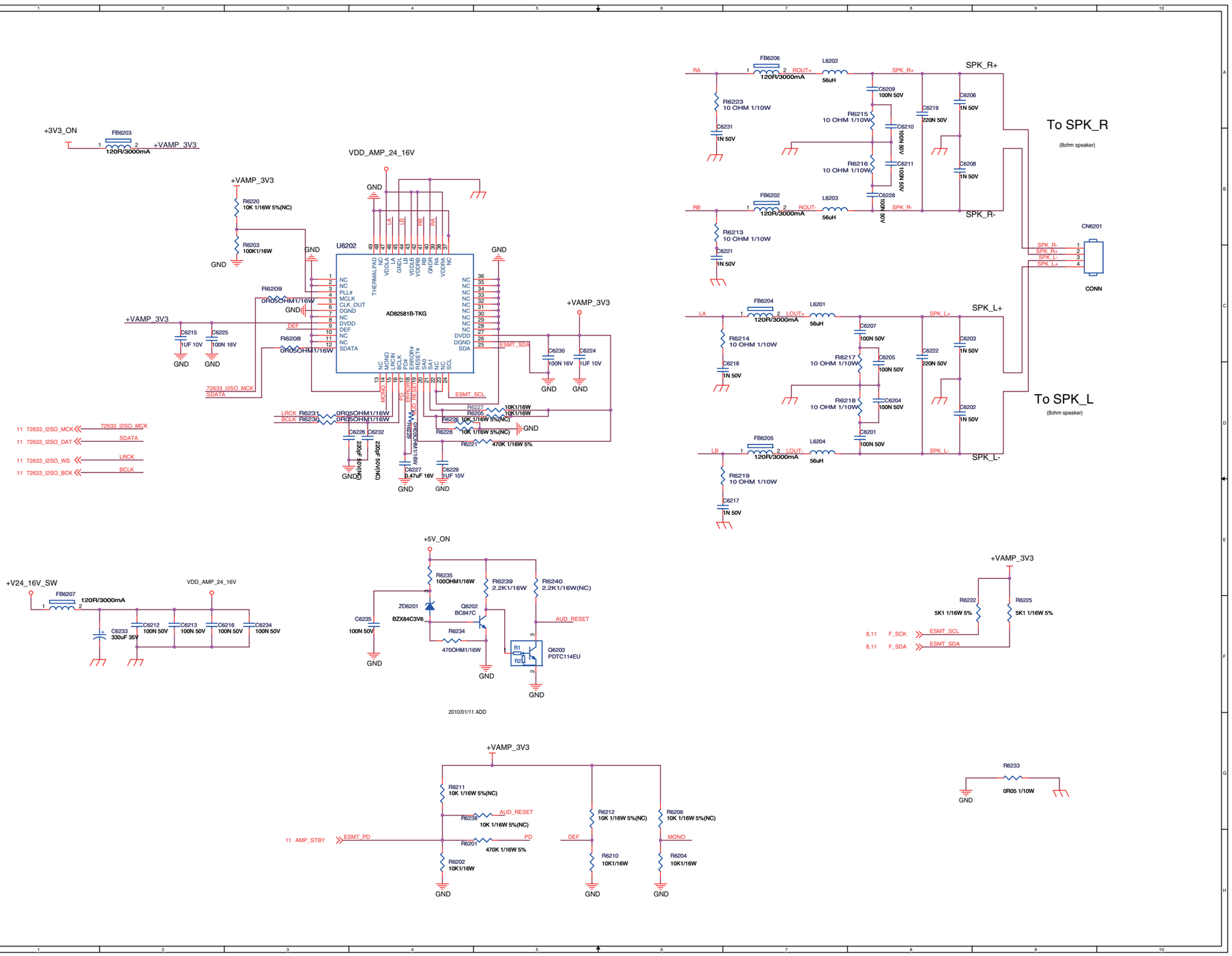
SSB: Audio amplifier

B17 Audio amplifier

B17



CN6201 B9 C6201 D7
C6202 D8 C6203 C8
C6204 D8 C6205 C8
C6206 A8 C6207 C7
C6208 B8 C6209 A8
C6210 A8 C6211 B8
C6212 F2 C6213 F2
C6215 C2 C6216 F2
C6217 E6 C6218 D6
C6219 A8 C6221 C6
C6222 C8 C6224 C5
C6225 C2 C6226 D3
C6227 D4 C6228 B8
C6229 D4 C6230 C5
C6231 B6 C6232 D4
C6233 F1 C6234 F3
C6235 F4 FB6202 B7
FB6203 B2 FB6204 C7
FB6205 D7 FB6206 A7
FB6207 E1 L6201 C7
L6202 A7 L6203 B7
L6204 D7 Q6202 F4
Q6203 F5 R6201 G4
R6202 H4 R6203 B3
R6204 H6 R6205 D5
R6206 G6 R6208 C3
R6209 C3 R6210 H5
R6211 G4 R6212 G5
R6213 B6 R6214 C6
R6215 A8 R6216 B8
R6217 C7 R6218 D7
R6219 D6 R6220 B3
R6221 D4 R6222 F8
R6223 A6 R6225 F9
R6226 D4 R6227 D5
R6228 D4 R6229 D4
R6230 D3 R6231 D3
R6233 G9 R6234 F4
R6235 E4 R6238 G4
R6239 E5 R6240 E5
U6202 C3 ZD6201 E4

AUDIO_AMP_AD82581B	715G3891	A 2010-04-02

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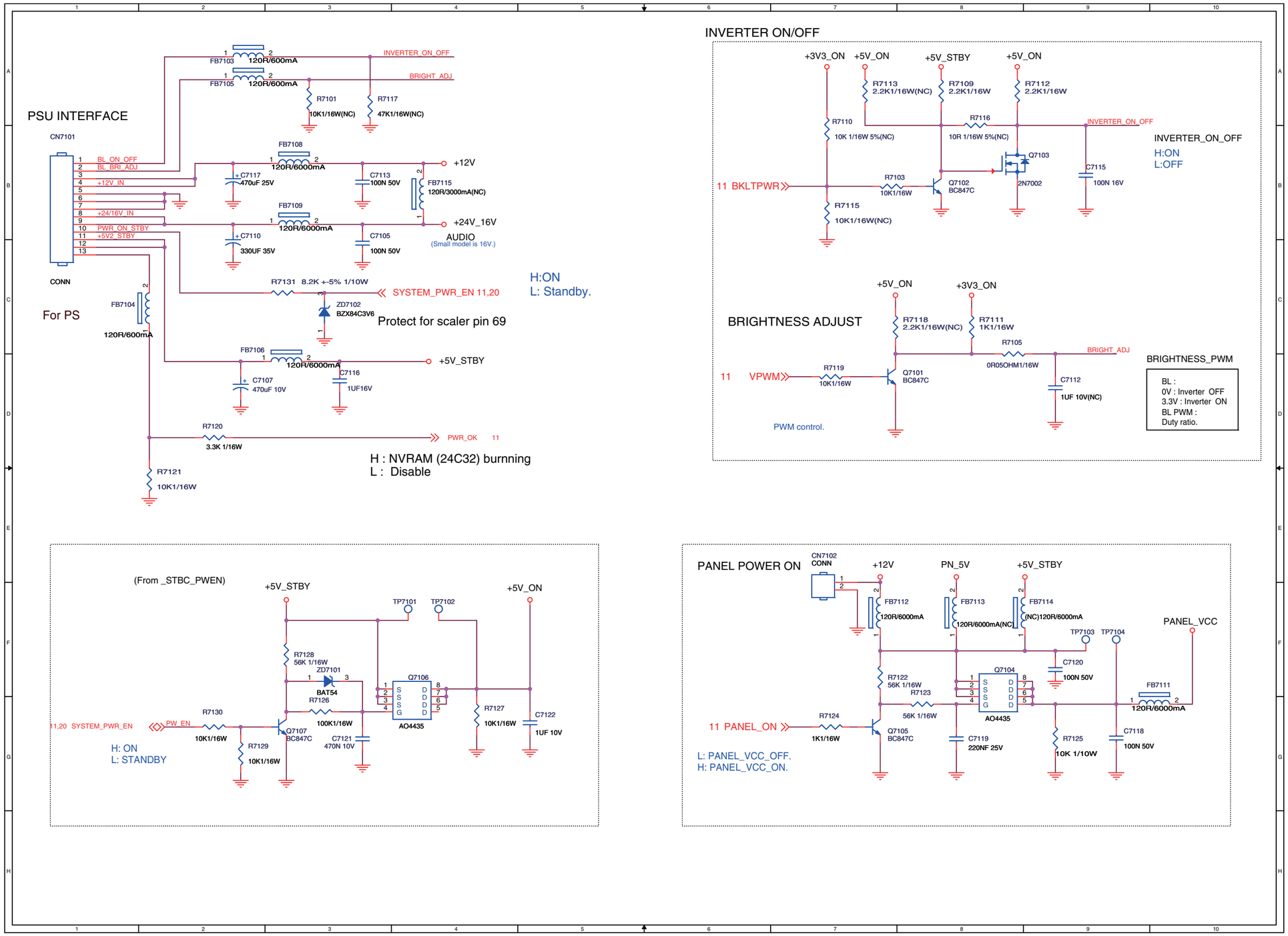
SSB: PSU & Inverter I/F

B18 PSU & INVERTER I/F **B18**



CN7101 B1 CN7102 E7
C7105 B3 C7107 D2
C7110 B2 C7112 D9
C7113 B3 C7115 B9
C7116 D3 C7117 B2
C7118 G9 C7119 G8
C7120 F9 C7121 G3
C7122 G4 FB7103 A2
FB7104 C1 FB7105 A2
FB7106 C3 FB7108 B3
FB7109 B3 FB7111 F9
FB7112 F7 FB7113 F8
FB7114 F8 FB7115 B4
Q7101 D7 Q7102 B8
Q7103 B8 Q7104 F8
Q7105 G7 Q7106 F3
Q7107 G3 R7101 A3
R7103 B7 R7105 C8
R7109 A8 R7110 A7
R7111 C8 R7112 A8
R7113 A7 R7115 B7
R7116 A8 R7117 A3
R7118 C7 R7119 D7
R7120 D2 R7121 D2
R7122 F7 R7123 F8
R7124 G7 R7125 G9
R7126 F3 R7127 F4
R7128 F3 R7129 G2
R7130 G2 R7131 C3
TP7101 F4 TP7102 F4
TP7103 F9 TP7104 F9
ZD7101 F3 ZD7102 C3

PSU & INVERTER I/F	715G3891	A 2010-04-02

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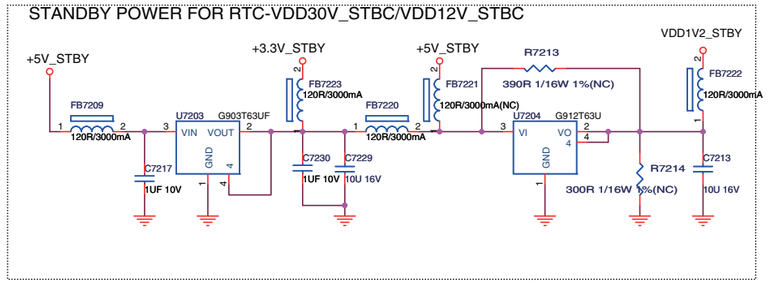
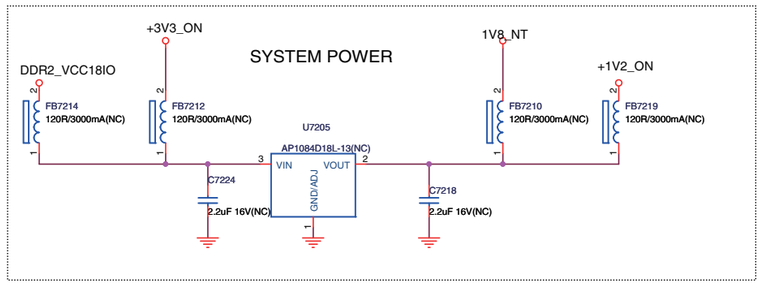
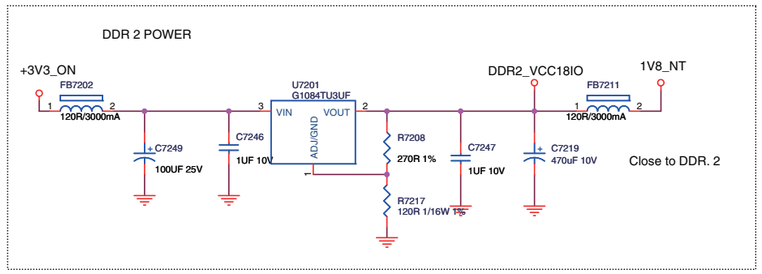
100802

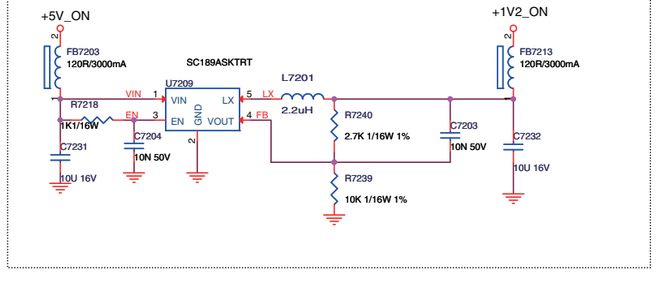
SSB: DC-DC Power

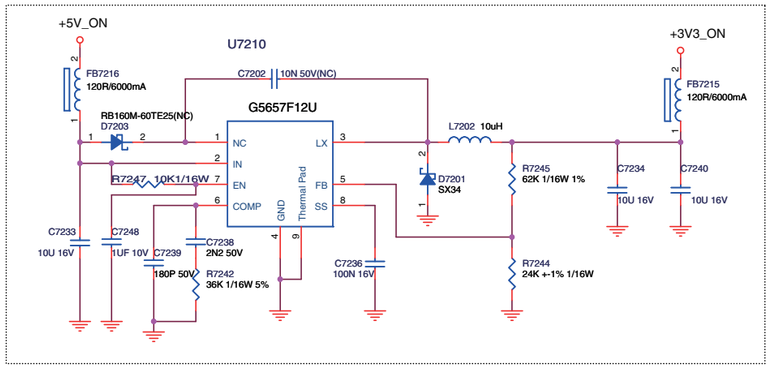
B19 DC-DC POWER **B19**

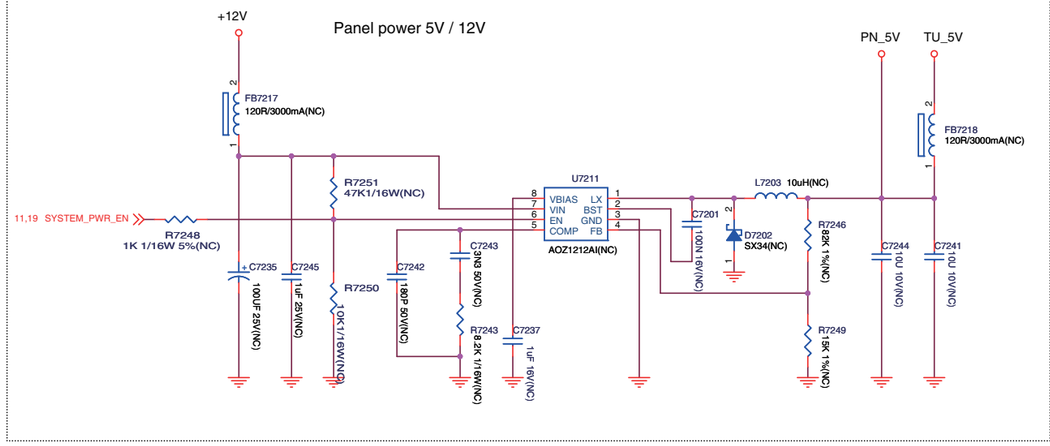












	5V	12V
R7246	82K	210K
R7249	15K	15K

C7201 E8 C7202 A7
C7203 G3 C7204 G1
C7213 B4 C7217 B1
C7218 D3 C7219 E3
C7224 D2 C7229 B2
C7230 B2 C7231 G1
C7232 G3 C7233 B6
C7234 B8 C7235 E6
C7236 B7 C7237 E7
C7238 B6 C7239 B6
C7240 B9 C7241 E9
C7242 E7 C7243 E7
C7244 E9 C7245 E6
C7246 E2 C7247 E3
C7248 B6 C7249 E1
D7201 B7 D7202 E8
D7203 A6 FB7202 E1
FB7203 G1 FB7209 A1
FB7210 C3 FB7211 E4
FB7212 C1 FB7213 G3
FB7214 C1 FB7215 A8
FB7216 A5 FB7217 D6
FB7218 D9 FB7219 C4
FB7220 A3 FB7221 A3
FB7222 A4 FB7223 A2
L7201 G2 L7202 A7
L7203 E9 R7208 E3
R7213 A3 R7214 B4
R7217 F3 R7218 G1
R7239 G2 R7240 G2
R7242 B6 R7243 E7
R7244 B8 R7245 B8
R7246 E9 R7247 B6
R7248 E6 R7249 E9
R7250 E6 R7251 D6
U7201 E2 U7203 A2
U7204 A3 U7205 C2
U7209 G2 U7210 A6

DC-DC POWER	715G3891	A 2010-04-02

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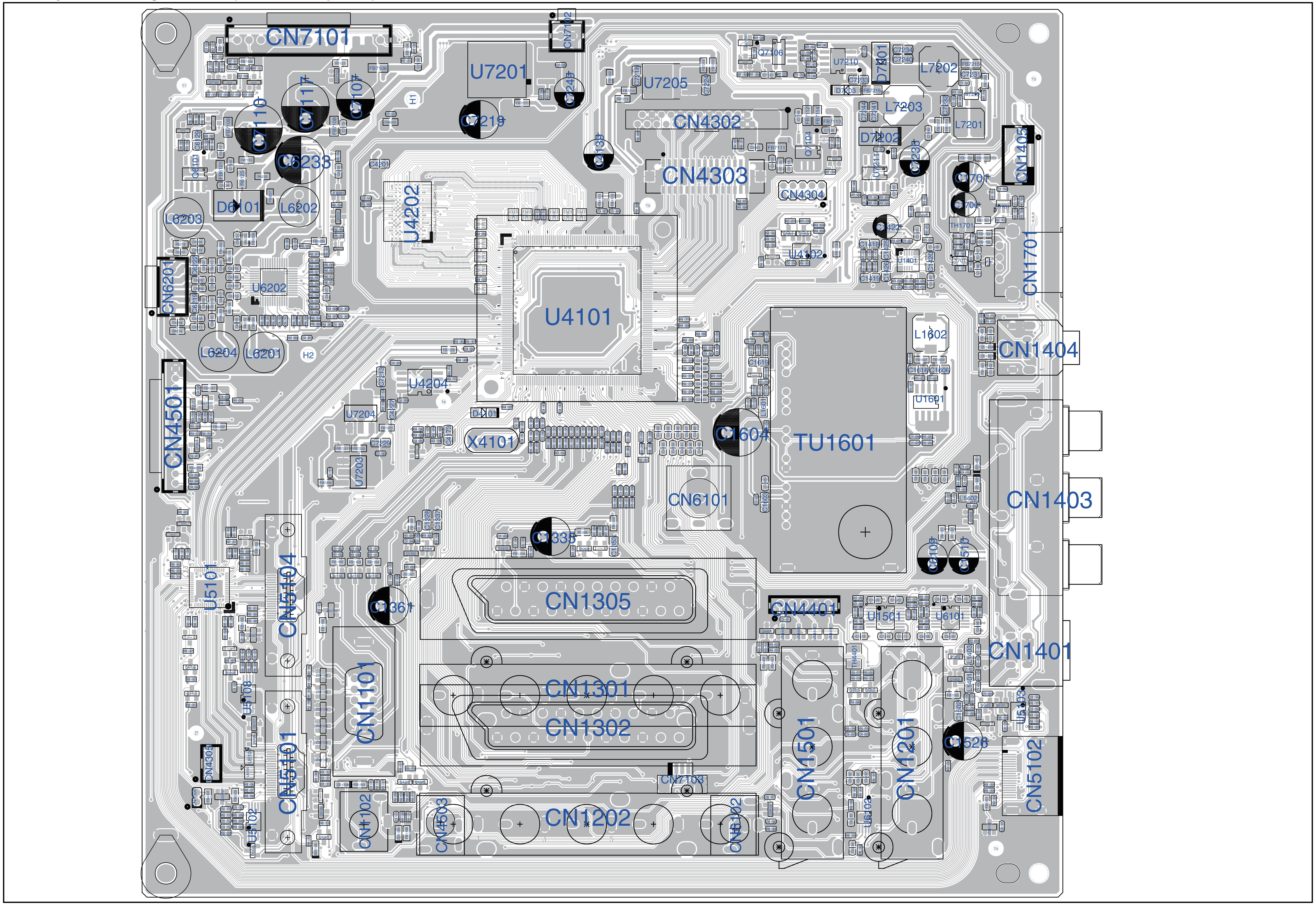
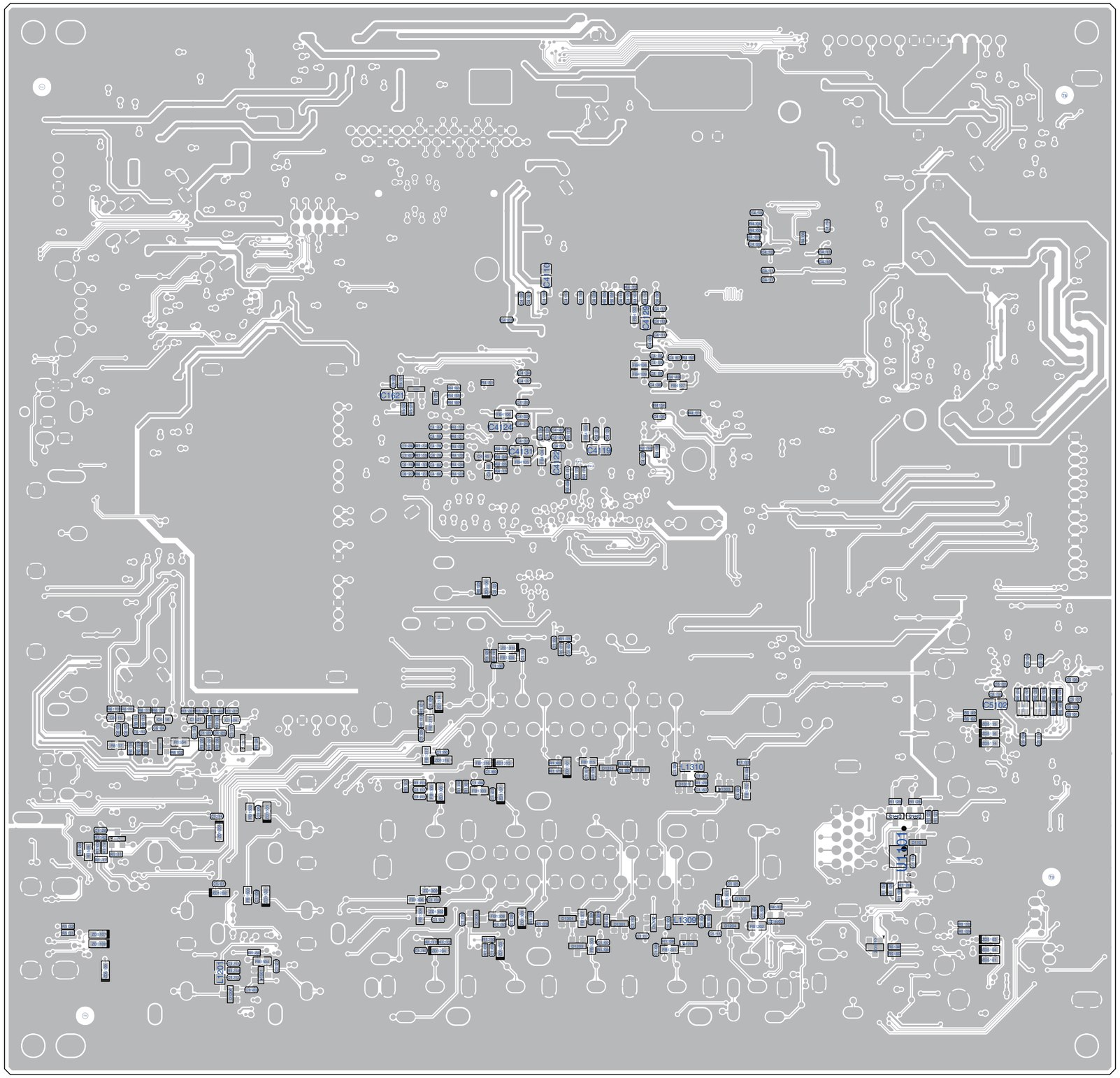
Layout Small Signal Board (Overview Top Side)



CN7101
U7201
CN7102
U7205
Q7106
U7210
D7201
C7234
C7240
L7202
C7117
C7107
C7110
C7219
C7249
CN4302
L7203
L7201
D7203
D7202
C6233
C4139
CN4303
C7235
CN1405
C4201
CN4304
C1701
D6101
L6202
L6203
U4202
C1706
TH1701
C1422
U4102
U1401
CN1701
CN6201
U6202
U4101
L6204
L6201
H2
L1602
CN1404
CN4501
U4204
U7204
U1601
D4101
X4101
C1604
TU1601
U7203
CN6101
CN1403
C1335
C6109
C1510
CN1305
CN4401
U1501
U6101
U5101
CN5104
C1361
CN1401
CN1301
CN1302
CN1101
U5108
CN4305
CN5101
C1526
CN7103
CN1501
CN1201
CN5102
CN1102
CN4503
CN1202
CN6102
U6102
U5102
U5103

19020_525_100802.eps
100802

Layout Small Signal Board (Overview Bottom Side)

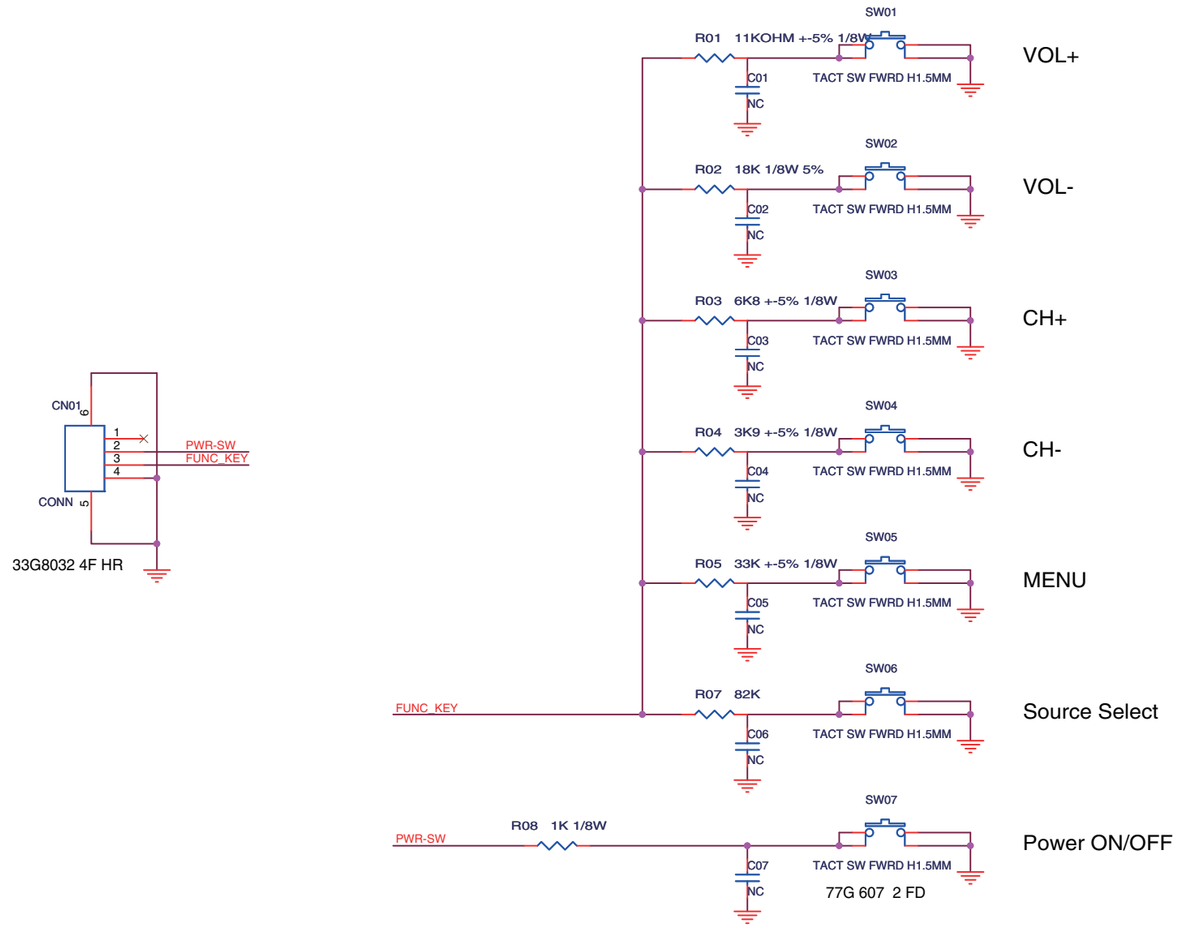


19020_526_100802.eps
100802

Keyboard Control Panel

E Keyboard Control Panel E

CN01 A1 C01 A1
C02 A1 C03 A1
C04 A1 C05 A1
C06 A1 C07 A1
R01 A1 R02 A1
R03 A1 R04 A1
R05 A1 R07 A1
R08 A1 SW01 A1
SW02 A1 SW03 A1
SW04 A1 SW05 A1
SW06 A1 SW07 A1

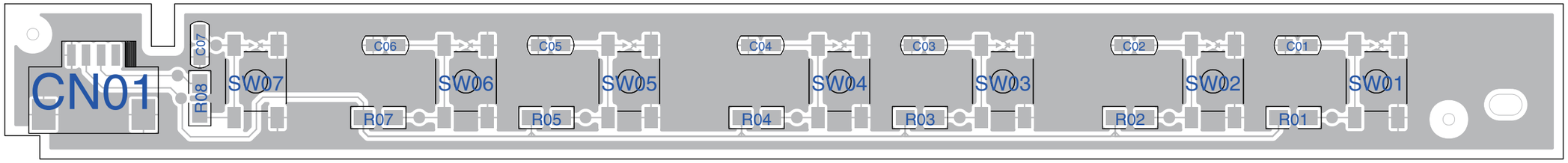


SIDE CONTROL	715G3814	A 2010-04-02

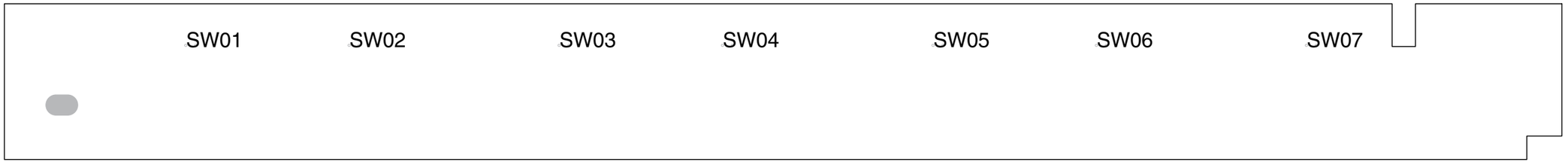
19020_527_100802.eps
100802

Layout Keyboard Control Panel

Layout Keyboard Control Panel (Top Side)



Layout Keyboard Control Panel (Bottom Side)



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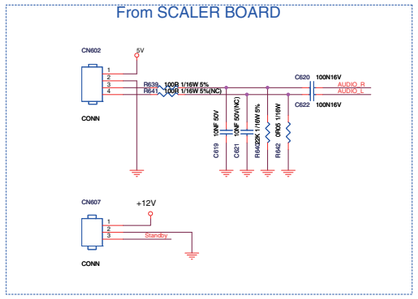
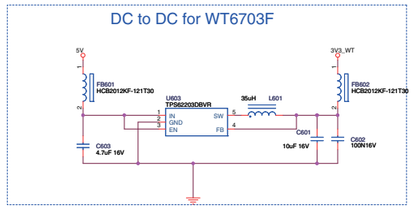
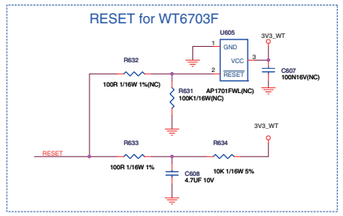
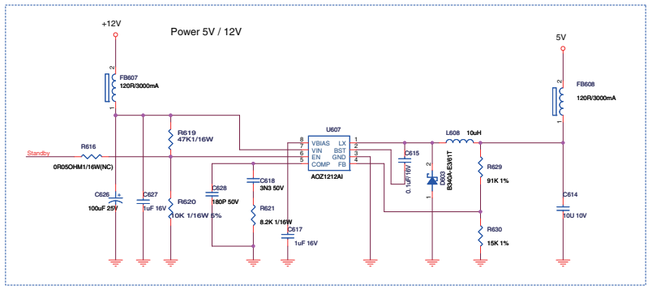
Bathroom Speaker Board

HS Bathroom Speaker Board **HS**

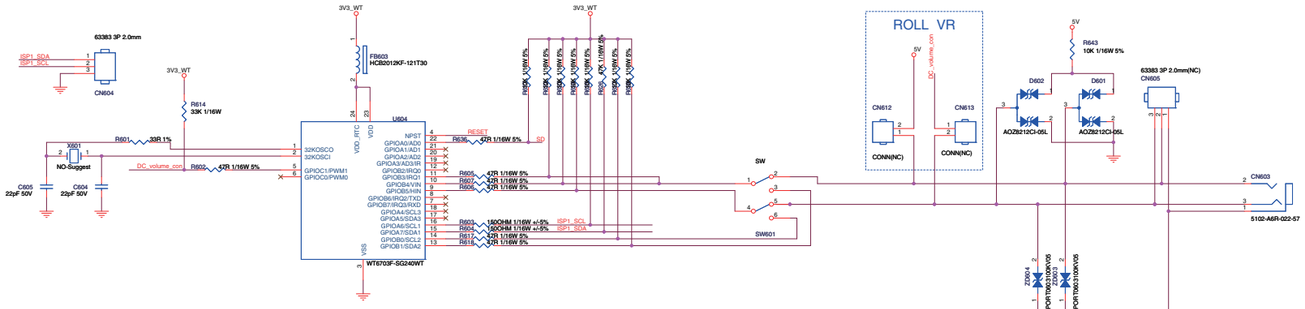




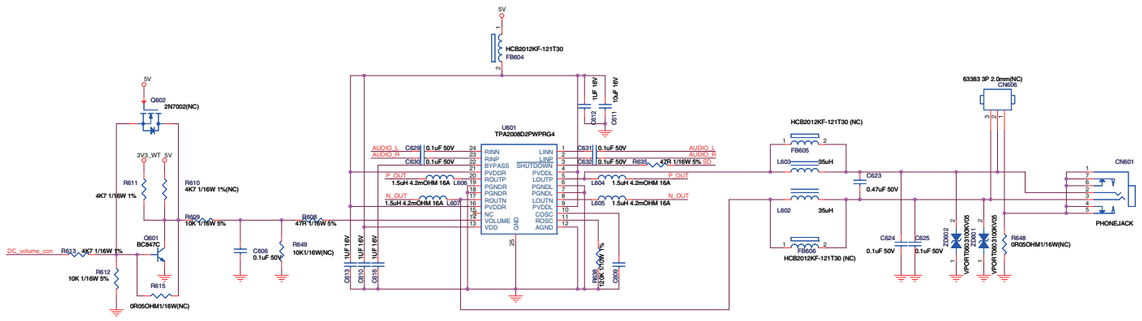




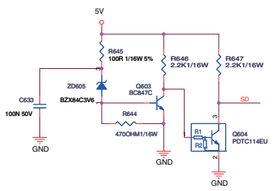
Three types of bathroom speaker volume control



BATHROOM SPEAKER OUT



POP NOISE



CN601 D4 CN602 A1
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CN605 B4 CN606 D4
CN607 B1 CN612 B3
CN613 B4 C601 A2
C602 A3 C603 A2
C604 C2 C605 C1
C606 D2 C607 A3
C608 A3 C609 D3
C610 D2 C611 D3
C612 D3 C613 D2
C614 A5 C615 A5
C616 D2 C617 B5
C618 A4 C619 A1
C620 A1 C621 A1
C622 A1 C623 D3
C624 D4 C625 D4
C626 A4 C627 A4
C628 A4 C629 D2
C630 D2 C631 D3
C632 D3 C633 D4
D601 B4 D602 B4
D603 A5 FB601 A2
FB602 A3 FB603 B2
FB604 C3 FB605 D3
FB606 D3 FB607 A4
FB608 A5 L601 A2
L602 D3 L603 D3
L604 D3 L605 D3
L606 D2 L607 D2
L608 A5 Q601 D2
Q602 D2 Q603 D5
Q604 D5 R601 B2
R602 C2 R603 C2
R604 C2 R605 C2
R606 C2 R607 C2
R608 D2 R609 D2
R610 D2 R611 D2
R612 D2 R613 D2
R614 B2 R615 D2
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R618 C2 R619 A4
R620 A4 R621 A4
R622 B3 R623 B3
R624 B3 R625 B3
R626 B3 R627 B3
R628 B3 R629 A5
R630 B5 R631 A3
R632 A3 R633 A3
R634 A3 R635 D3
R636 B2 R637 B3
R638 D3 R639 A1
R640 A1 R641 A1
R642 A1 R643 B4
R644 D5 R645 D5
R646 D5 R647 D5
R648 D4 R649 D2
SW601 C3 U601 D3
U603 A2 U604 B2
U605 A3 U607 A5
X601 B2 ZD601 D4
ZD602 D4 ZD603 C4
ZD604 C4 ZD605 D5

BATHROOM SPEAKER	715G4215	A 2010-04-02

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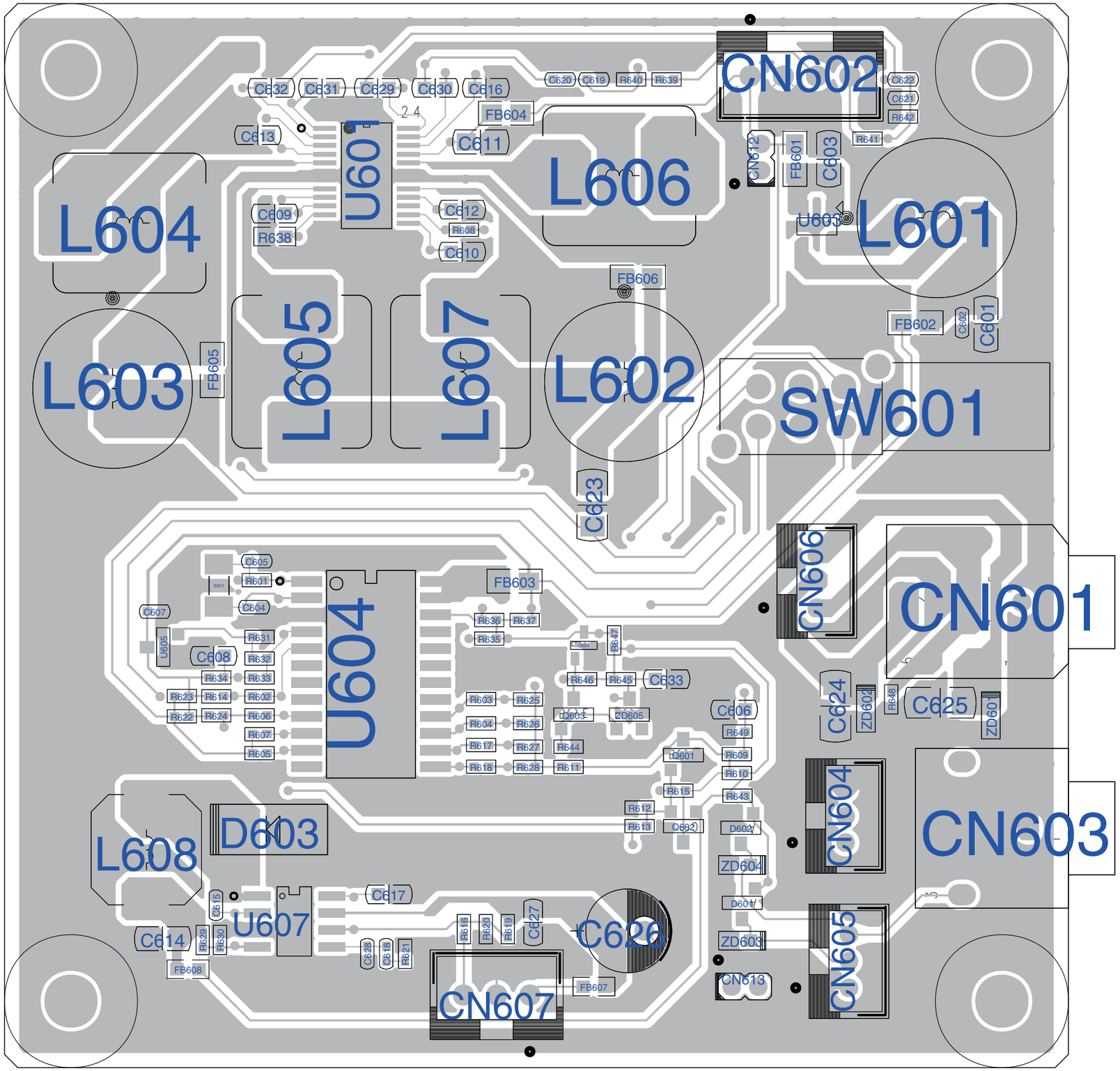
Layout Bathroom Speaker Board (Top Side)



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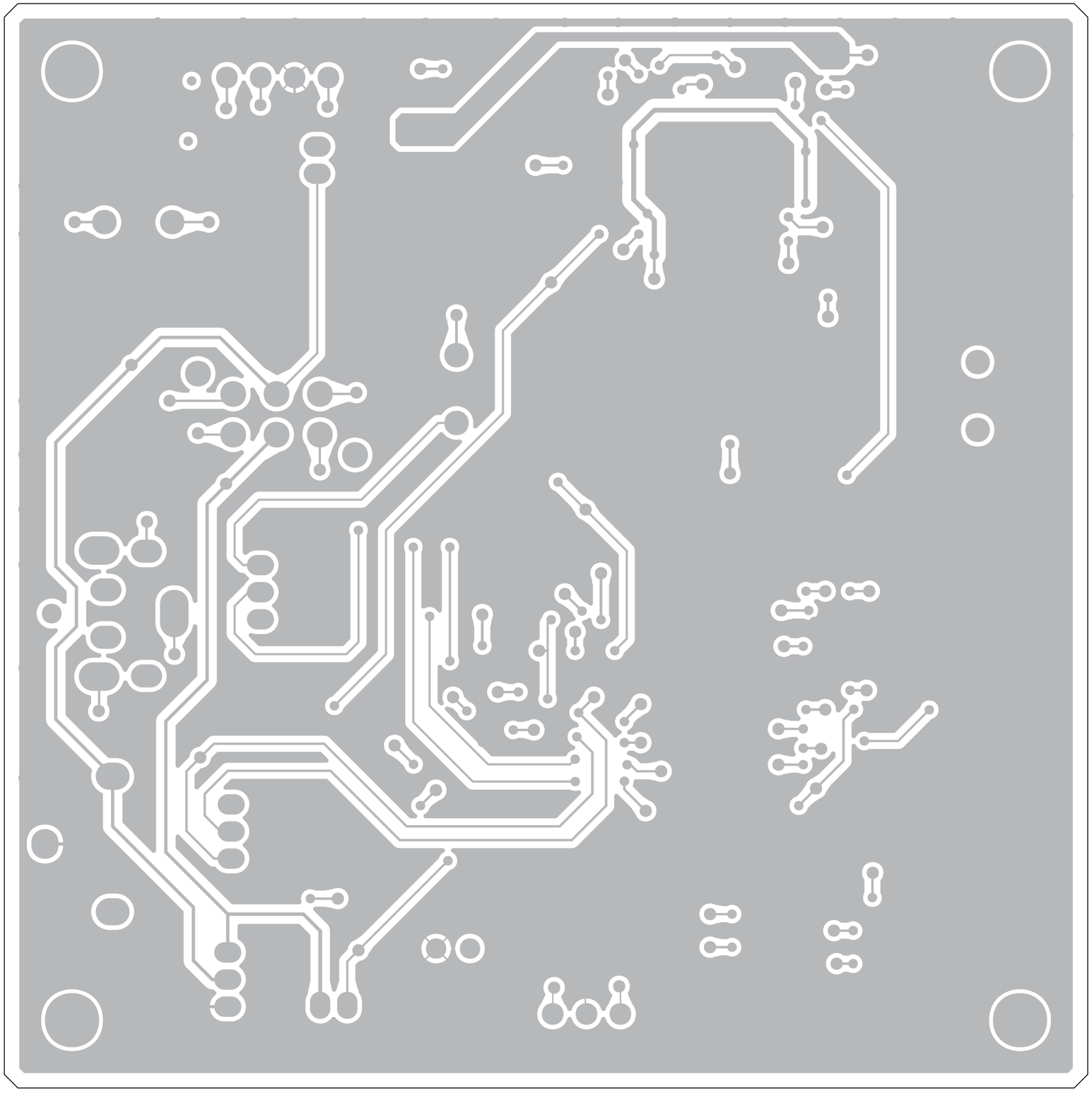
Layout Bathroom Speaker Board (Bottom Side)



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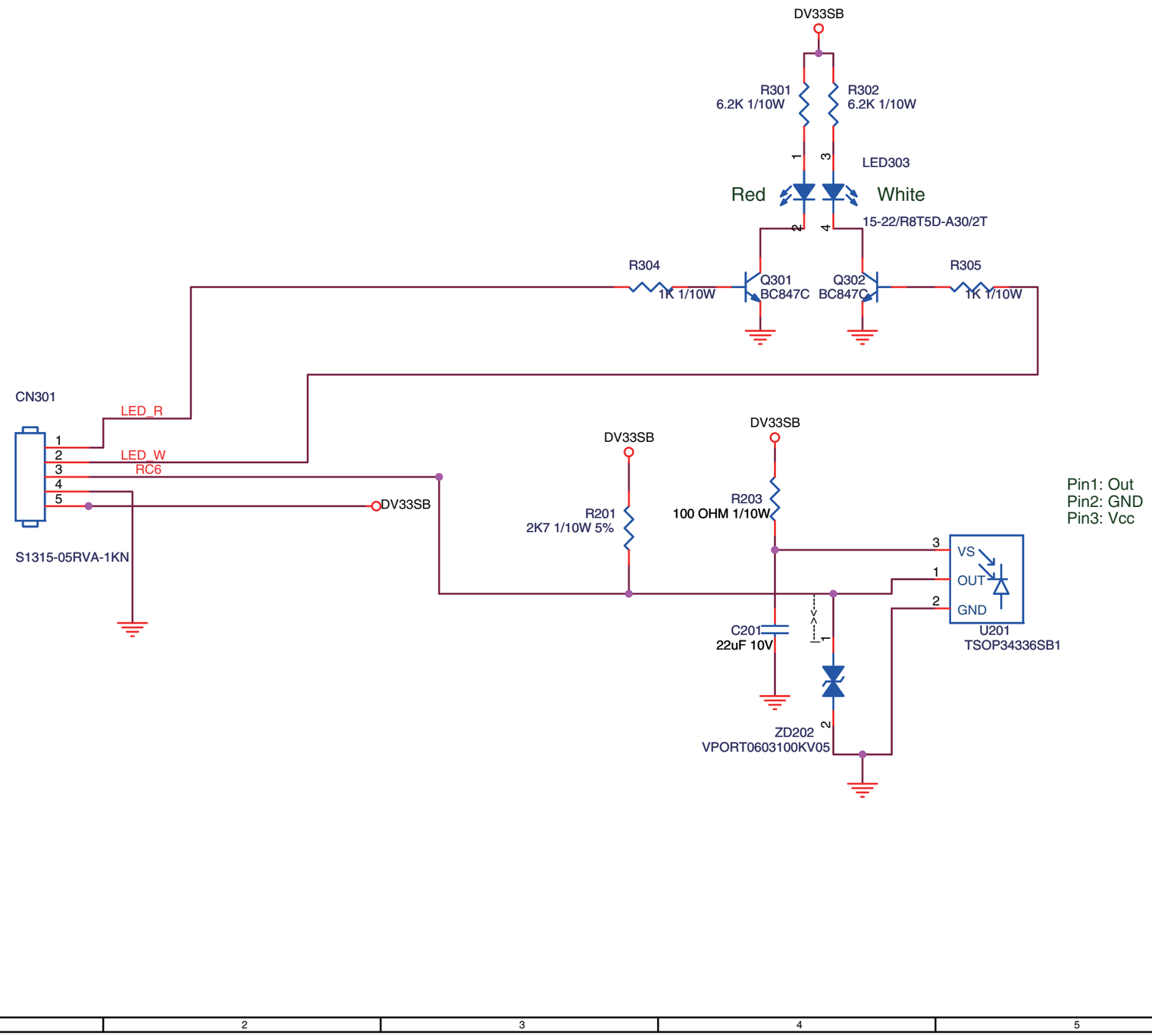
IR/LED Board

J IR/LED Board J

CN301 B1 C201 C4
LED303 A4 Q301 B4
Q302 B4 R201 B3
R203 B4 R301 A4
R302 A4 R304 B3
R305 B4 U201 C4



IR/LED BOARD	715G4294	A 2010-04-02

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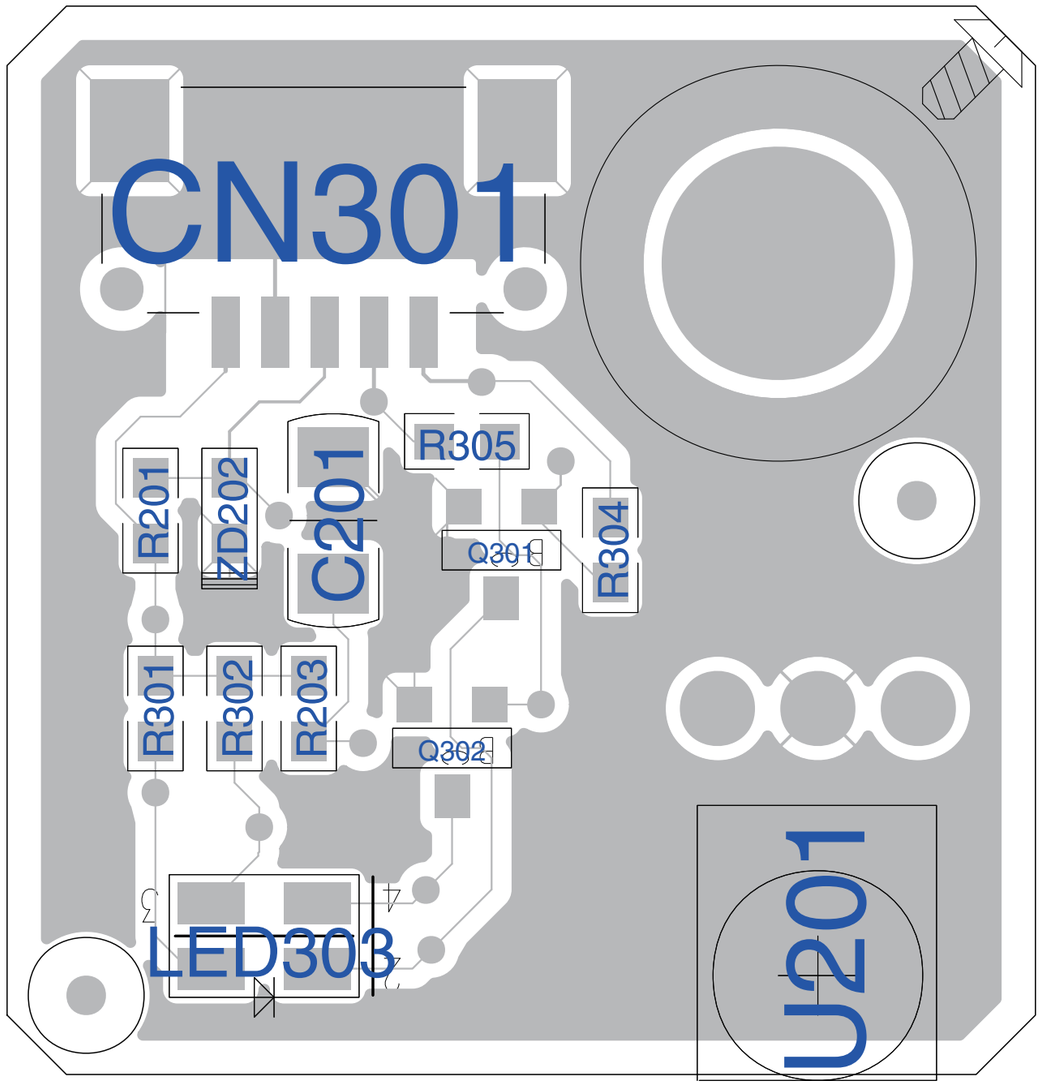
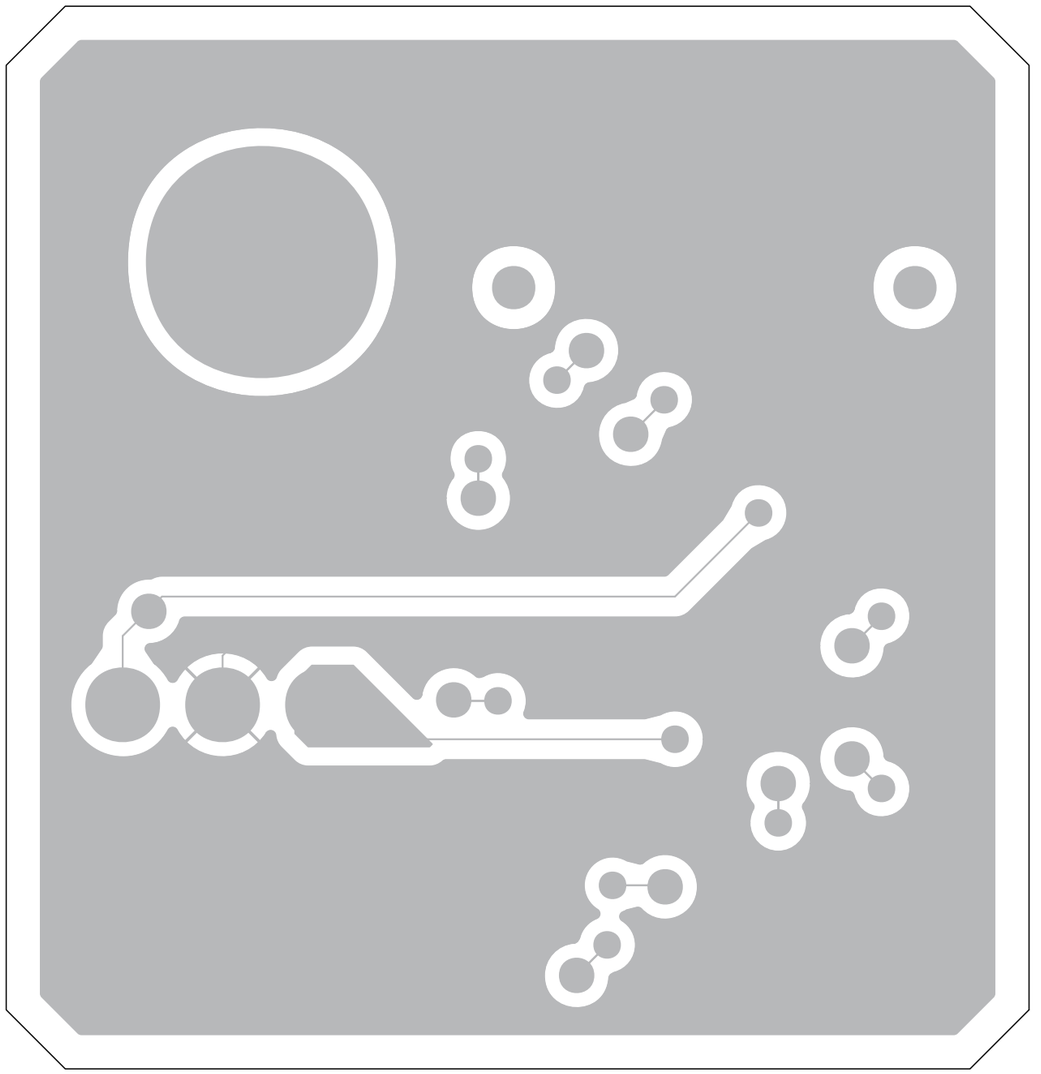
Layout IR/LED Board

Layout Keyboard Control Panel (Top Side)



Layout Keyboard Control Panel (Bottom Side)



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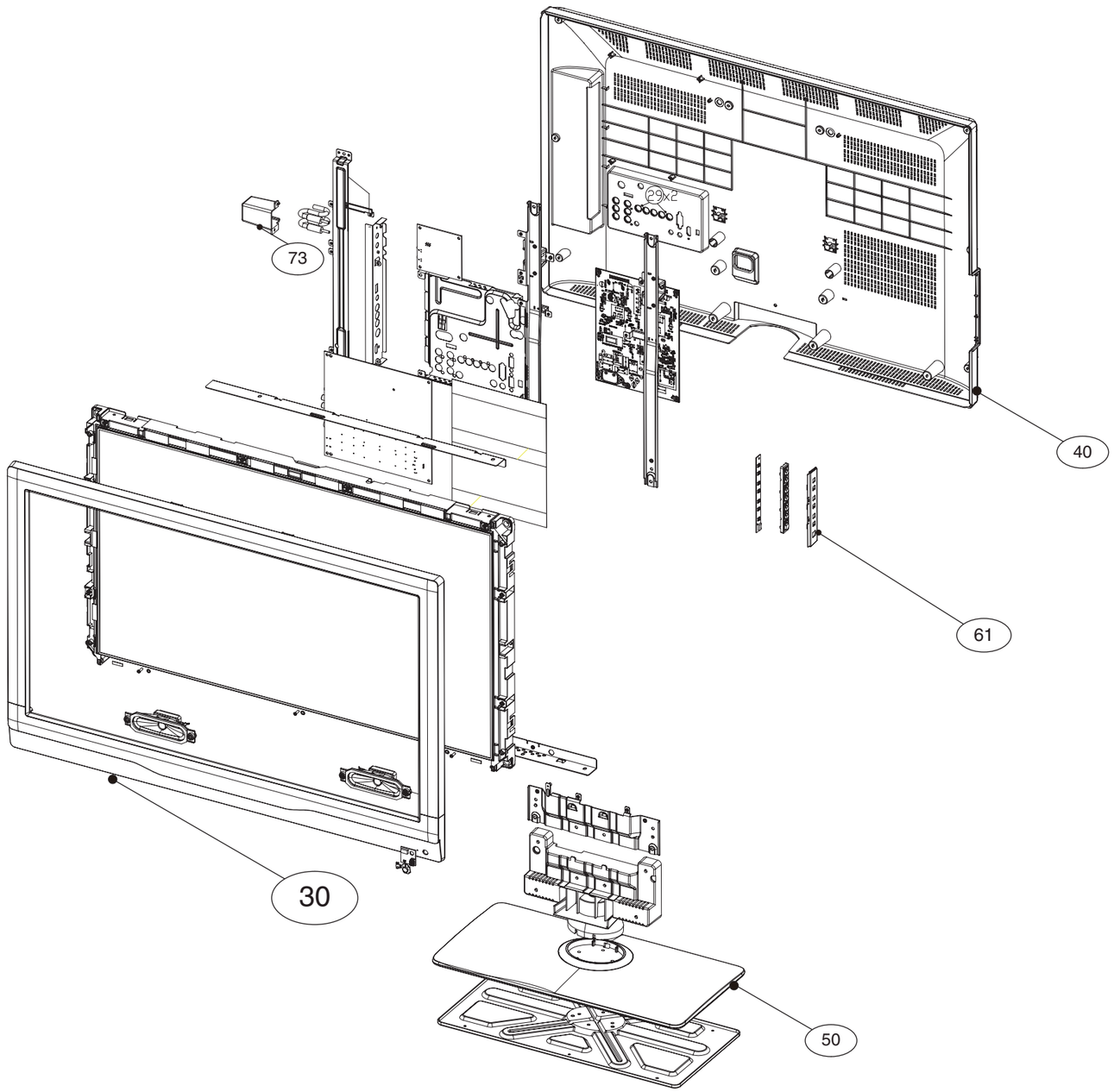
11. Styling Sheets

Styling Sheet 32"

Pro Plus 32"



Pos No.	Description	Remarks
30	FRONT CABINET	
40	REAR COVER	
50	STAND ASSY	
1176	REMOTE CONTROL	
61	KEY COVER	
73	BATHROOM MODULE COVER	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

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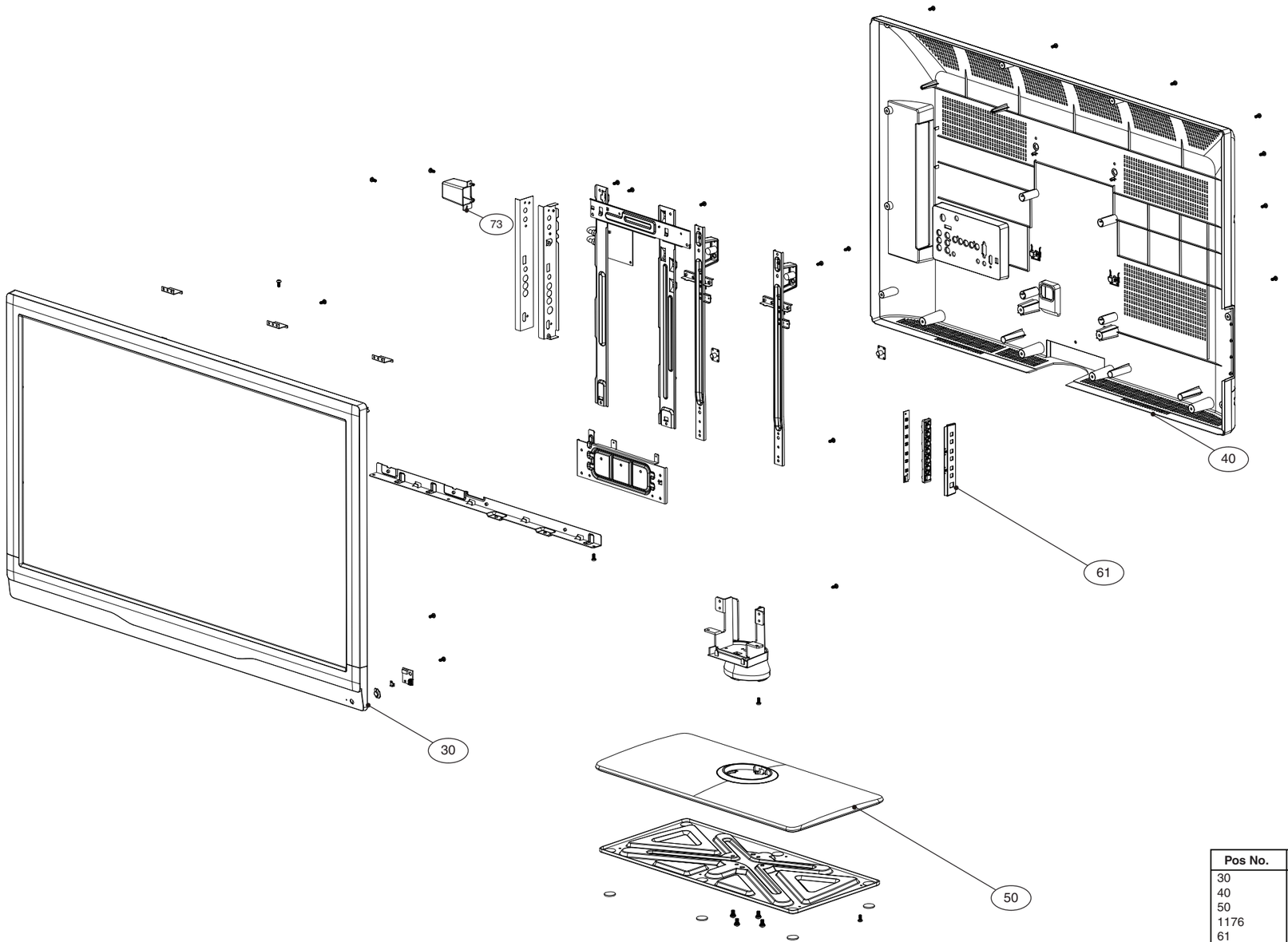
Styling Sheet 37"

Pro Plus 37"



Pos No.	Description	Remarks
30	FRONT CABINET	
40	REAR COVER	
50	STAND ASSY	
1176	REMOTE CONTROL	
61	KEY COVER	
73	BATHROOM MODULE COVER	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

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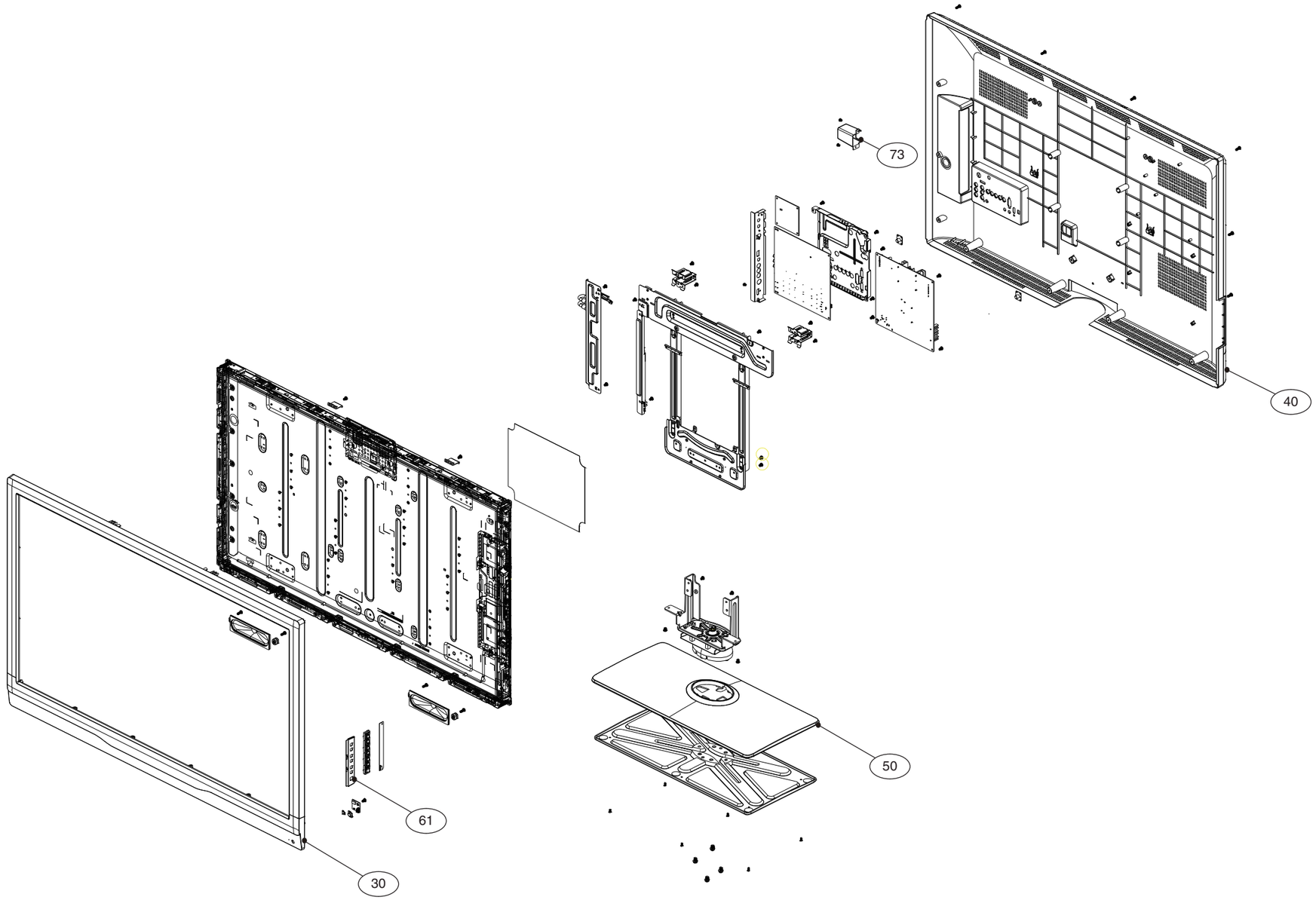
Styling Sheet 42"

Pro Plus 42"



Pos No.	Description	Remarks
30	FRONT CABINET	
40	REAR COVER	
50	STAND ASSY	
1176	REMOTE CONTROL	
61	KEY COVER	
73	BATHROOM MODULE COVER	

FOR ELECTRICAL PARTS/ASSEMBLIES SEE WIRING DIAGRAM CHAPTER 9

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